RAILROAD GAZETTE

FRIDAY, NOVEMBER 25, 1898

CONTENTS.

Contributions.

The Bell Spark Arrester—A Correction.

Pittsburgh, Nov. 19.

To the Editor of the Railroad Gazette:

I beg to correct an erroneous statement which appears in your description of the Brooks consolidation engines in your issue of the 18th inst., viz.: that these engines are fitted with the latest form of spark arrester designed by me. This is not the fact, as they have diamond stack spark arresters, and, while I should have been very much pleased if my design had been adopted, that of Mr. McConnell is, in my opinion, good and sound practice, and, as demonstrated by the results which he has shown, greatly superior, as to steaming capacity, freedom from fire throwing, and fuel economy, to the extended smoke box constructions which are now being relegated to the category of "has beens."

The mention, by an oversight, of my design in this connection was doubtless due to the fact that it is being applied to a considerable extent in the practice of the Brooks Locomotive Works, my last advices from that company being that they have put it on 71 engines, built by them for the Great Northern, Wiscon Central, B. R. & P., and Monon roads, none of which has a boiler less than 64 inches in diameter.

J. SNOWDEN BELL.

New York and Brooklyn Bridge.

Washington University,
St. Louis, Mo., Nov. 21, 1898.

To the Editor of the Railroad Gazette:

Referring to the analysis of the accident to the New York and Brooklyn Bridge on July 29 last, given in your issue of Nov. 18, I wish to offer this one suggestion: It would seem that the lesson for designers to learn from this accident is, either to omit the stays altogether, or, if they are used, they should all pass over the saddle and move with it, along with the movement of the cables. It seems to have been the rigid attachment of some of these stays to the tops of the piers which caused the upward buckling of the trusses near the ends when the loads and temperature combined to let down all other parts of the bridge.

J. B. JOHNSON.

Nov. 19, 1898.

To the Editor of the Railroad Gazette:

The description of the buckling of the trusses of the New York and Brooklyn Bridge by Mr. Collingwood is very clear and comprehensive, and his explanation of the cause of failure is thoroughly sound.

Although Mr. Collingwood speaks of this occurrence as "unfortunate," it is probably the most fortunate thing which has happened to the bridge since its construction. While there is no danger to life or limb in this instance, except through a possible panic, the accident has taught the public as nothing else could have done that the restrictions to traffic are based upon reason and necessity rather than upon the arbitrary will of the management. It has also demonstrated the need in the near future of an additional structure in the vicinity of the present bridge.

The surface cars have so greatly increased the usefulness of the bridge that their right to better accommodations is established. The present terminal arrangements of these cars are far more dangerous to life than is any weakness of the bridge itself, yet there is but little chance of improvement with the present structure. On the other hand, the roadway has been perverted from its original use, and a new wagonway is required unless the present one is restored by providing other accommodations for the cars. The present arrangements can be, at best, only a temporary makeshift until more complete accommodations are provided, and the buckling of a stiffening truss would be welcomed if it hastened better transit facilities.

The accident has been accepted by the public as the first indication of failure of an overloaded structure. That the bridge is able to endure this without critical danger to life should not tempt the public to its indefinite abuse.

The rapid transit problem of New York City is not confined to the Island of Manhattan.

HENRY B. SEAMAN.

Trenton, N. J., Nov. 21, 1898.

To the Editor of the Railroad Gazette.

No monograph or complete report on the East River Bridge has been published by me for the reason that, owing to eye troubles and other inhibitory difficulties, I have not been able to go through the physical labor involved in its preparation.

As the occasion of this discussion, prompted as it is at the present time by the buckling of the lower truss chord, hinges entirely on the use of overfloor stays, I will say at once that in any future suspension bridge I would dispense with their use, because they do not harmonize with the position of the cables under all conditions of temperature. The stays were part of the original design proposed by Mr. John A. Roebling. They were finally retained by me, not so much on account of the stiffness they afford, but because, long before the cables were completed, I had to look in every direction for an increase in supporting power, which they alone could give—small as it is. Having decided to use them, it became necessary to place the expansion joint of the truss beyond the stays, preferably at the center—a neutral point when the chord strains change. The stiffness of the truss has not been impaired thereby; in fact, it has even more stiffness than is required by the traffic. Without stays the position of the expansion joint would be in the towers, or in some cases at the anchorages. The original design provided for a small slip joint every 30 ft. in the truss—in other words, no truss at all.

About 14 years were consumed in the construction of the East River Bridge. At the beginning neither elevated roads run by locomotives nor electric roads were thought of. When the bridge was half finished the elevated road demanded the right of way, and shortly after its completion the electric road also pressed for recognition.

In 1880 some of the Bridge Trustees, notably W. C. Kingsley, insisted that I should adapt the bridge for the passage of elevated locomotive trains, to take the place ultimately of cable-propelled trains. I yielded with reluctance and against my better judgment. It implied directly a greater load on the cables and indirectly a still greater load, because the heavier load demanded greater truss power against deformation. As a compromise, the central trusses were raised, while the outer ones were left at the original height; all of which is structurally wrong, leaving the outer truss liable to such minor accidents as the recent buckling.

A further source of increased load arose from the widening of the roadways, giving each a double track instead of a single track and useless sidewalk. The adoption of a cable grip, whereby two alternating trains were replaced by numerous circulating trains, also added much to the moving load. I partly provided for this increase by using high cast steel wire for the cables. The margin of safety, however, suffered a material reduction.

But the crying evil on the bridge is that, every year since it has been opened to traffic, there have been numerous additions to the dead load, small in themselves, but large in the aggregate. They amount to fully 15 per cent., if not more, all of which must be multiplied by a factor of tension of 1.70, and is intensified by being carried chiefly by the two middle cables. They comprise, for example, telegraph cables and wires, pneumatic tubes, double lines of rails, fastenings, sheaves and ropes, trolley wires with extra heavy supporting brackets, heavy rails for trolley cars, heavier planking, electric light stands, etc., etc.

The climax of overloading was reached when the trolley took possession of the roadways and began to run in defiance of all stipulation, as regards weight of cars or distances apart. I can readily believe that the incident of a horse dying on the track caused a blockade of cars, which increased the live load from two to even three times what it was fixed at originally. Similar blockades on a smaller scale have happened before, and the bottom chords have buckled before, and, in all probability, will again.

It has been charged that but for my acquiescence the trolley would never have gained a foothold on the bridge. But where is the man who ever succeeded in preventing a trolley from going where it wanted? The prospective advantages, both from a pecuniary view as well as in the increase of transit facilities, were so enormous that no power, barring the actual collapse of the structure, could have kept them off. I had thought that with full regulating powers vested in the bridge authorities we might run the risk, and in that I was mistaken.

What is needed at present is a recalculation of the loads and weights of the bridge, so as to determine the present margin of safety in the main parts of the structure, such as cables, anchorages, etc. Application to this effect has been made to the proper authorities by me, without any satisfactory result as yet.

I have no fear of the cables. They still have ample strength, and could pull up the anchorages with ease.

After such investigation we can determine whether it is advisable to lighten the structure and relieve it of at least a small portion of the load, which is constantly being added to, even now. To reinforce the cables would be a difficult, if not impossible, task. The anchorages can be reinforced.

W. A. ROEBLING,
Engineer Brooklyn Bridge.

From Trade to Profession—Advances in American Railroad Location.

By William G. Raymond.*

I.—INTRODUCTION.

Just as the work of the railroad locating engineer seemed about completed or reduced to the location of small branches and extensions or suburban electric lines, a new field of great extent appears, and a new season of activity for the locator and constructor seems to dawn.

The great empire of China, with its vast wealth of silver, gold, iron and coal, all as yet practically undeveloped; with its immense population of 350,000,000 souls, generally huddled in all too compact centers along its water ways; with its wonderfully fertile soil and generally mild and equable climate; with 1,500,000 square miles of territory in the eighteen provinces alone, and less than 400 miles of railroad, is to be opened by building many hundreds of miles of railroads, and American engineers are to have an active part in the work of construction.

Advances in the art of railroad location that have conspired to fit the American engineer for the work to be done may, perhaps, be best introduced by a brief consideration of some of the questions that will arise in Chinese railroad location and construction.

A recent writer on China,† an Englishman who has been an engineer, and who is familiar with the railroad systems of England and the Continent and India, and to some extent with those of this country, says that in China, where the business is to be enormous and must be handled at low rates, particularly the passenger business, the same solid character of construction must prevail that prevails at home (England); that the lighter "pioneer" railroads of America will be an unwise form to adopt. By low rates seem to be meant the rates of India, which are stated to be about one cent per ton mile for freight, and which are for passengers rather less than two-thirds of a cent per passenger mile. It is stated that on these Indian railroads the passenger may be carried 400 miles within 24 hours for about $2. This indicated speed, which perhaps corresponds with the speed on some of the minor western roads 20 years ago, will surely not demand much more solid construction than prevailed on those same western roads.

Another recent writer,‡ noting that many miles of the new line must lie along flat valleys subject to serious floods, holds that it will be doubtful policy to build solid high level lines, keeping well above these floods, but that it will probably be better to build low level cheap lines, and put up with inundated tracks, stopping traffic for greater or less lengths of time at more or less extended intervals. Such a low level line would certainly be unwisely built if built in any more substantial fashion than railroads of western America.

But probably the first writer quoted would advocate high level lines well above the possibility of overflow. The low level advocate writes after successful experience with cheap low level lines in Australia, and he speaks of the lines of China as pioneer lines in new country.

But China is not new; China is densely populated, and has an enormous actual trade and far greater potential business, only awaiting the advent of better means of handling it to become actual. The business will be such that delays will be serious in effect. On the other hand, there is no better way, at the outset of a railroad enterprise, to make money than to build quickly. Ordinary western United States operating speed will be ample for years to come. Hence good judgment half way around the globe from the field of effort would seem to indicate that high level, light railroads, with low gradients, are the proper railroads for China.

Nevertheless, it must be admitted that China is a country in which the population is not evenly distributed; it is a country, like almost every other country of great area, in which neither topography nor climate nor character of business will be the same

*Professor of Geodesy and Road Engineering in the Rensselaer Polytechnic Institute.

†Archibald R. Colquhoun in "China in Transformation."

‡George Phillips in "Pioneer Railways for Queensland."

throughout the Empire. Therefore conditions must be observed as they exist and works planned to meet them.

Practically nothing definite is now generally known of the detail of the topography or geology of the regions of China to be traversed by the first of the new lines of railroad. Some few general facts only are known. There are here and there individuals who have first hand knowledge of the character of a good portion of the country, but there is no knowledge in the minds of the mass of even well informed persons beyond some generally known facts. It is known, for instance, that between Han Kow on the Yang Tse River and Canton on the Pearl River, the termini of the recently granted American concession, is a range of mountains, the passes of which are stated by writers of more than 50 years ago to be 1,000 feet high. These figures have apparently been adopted by more recent writers, but there is a feeling among those who have looked into the matter that, if these figures are correct, they refer to elevation above surrounding country rather than to sea level.

It is supposed that the upper portion of the valley of the Pei, or North River, running south from this mountain range, is more of a gorge or cañon than a wide alluvial plain extending to the foot of abruptly rising mountains.

But of the valley of the Siang River, running north from the mountains, practically nothing is known. It is supposed to be a rich tea country, and its eastern slopes are supposed to contain large quantities of coal, and the valley is probably rolling and possibly steep.

A mountain 1,000 feet high means, as a prominent engineer recently said, only a few miles of 1 per cent. grade. But it may well be asked if in a country where rates must be low one can afford to say "only" when considering the introduction of a 1 per cent. grade. Still, a 1 per cent., or even a 2 per cent., grade will be such a vast improvement on the present system of packing, which causes coal worth 13 cents a ton at the mine to rise to the almost prohibitive price of $5.60 per ton 60 miles from the mine, a freight rate of nine cents a ton mile, that it may perhaps be tolerated even though economically unwise. Again, it is true that such grades may not be economically unwise, as they may be the lowest that can be obtained for any justifiable expenditure, and it may well be that the introduction of a single division of such grades will insure a low through, ruling grade.

With nine-hour labor of good quality quoted at from $6.00 to $8.00 per month, the cost of construction to sub-grade should be small, and hence apparently a comparative high value should attach to low rate grades. But against this must be argued low priced coal and low wages to operatives, reducing operating expenses, and hence the absolute value of low grades. But for a time, at least, superstructure and rolling stock must be imported from lands of higher priced labor, and a very considerable portion of the operating service must be foreign. Later the operating service will be, as in India, largely native. In India more than 95 per cent. of the employees are natives.

These many considerations are mentioned simply to indicate the great care and the excellent judgment that must be exercised in making the location for, and in constructing the new roads in China, a country peculiar, from our standpoint, in topography, climate and people.

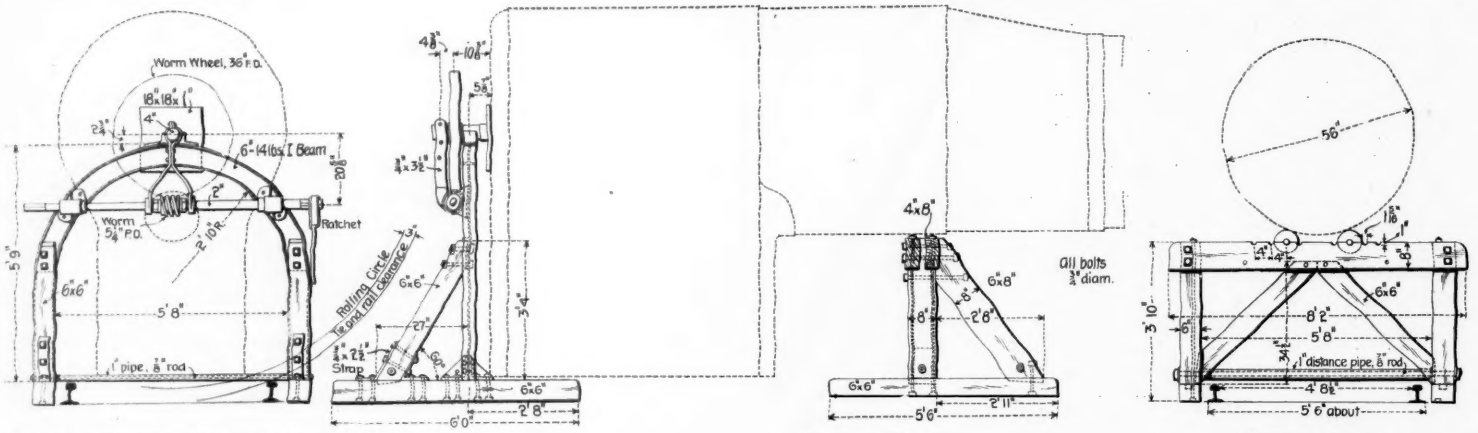
It is the purpose of this series of papers to point out the advance in American railroad location from a precedent following trade to the dignity of a profession of intelligent design. It is perhaps not too much to say that American engineers are now better fitted, because of their theoretical training and their practical acquaintance with both light pioneer railroads and substantial lines for heavy traffic in densely populated districts, to undertake the location and construction of the railroads of China, than are the engineers of other nations. They will bring to this work minds trained to observe existing conditions, and to plan in accordance with those conditions. That this fact has already been recognized by China is evidenced by the appointment of an American as consulting railroad engineer.

The mere suggestion of this new work, the information to be obtained, and the difficulties to be overcome, make a consideration of the equipment of the modern locating engineer for his work, as compared with his equipment and methods of some 20 or 25 years ago, when railroad location in this country was at its height, a consideration of interest.

The subject will be considered under three heads:

1. The qualities looked for in an engineer, and his understanding of the problem given him.
2. Field methods.
3. New values for equating.

In these considerations it is hoped the older men may find some pleasant history, and the younger men some facts of value to them.

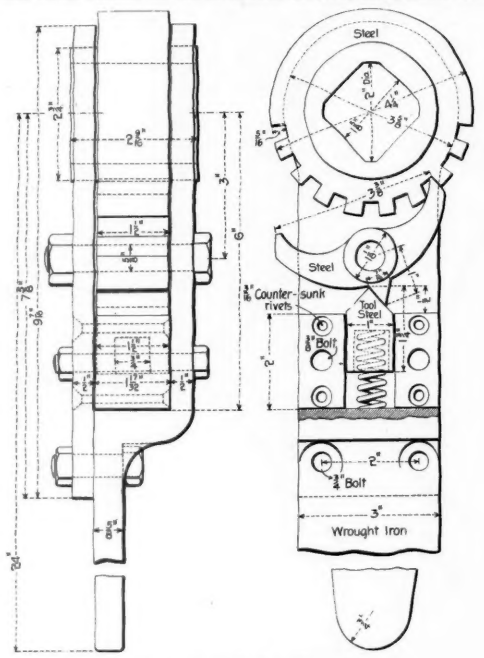


End View, Showing Ratchet and Worm. *Boiler in Position.* *Forward Trestle.*

Boiler Shop Trestle.—Chicago & Northwestern Railway.

Boiler Shop Trestle—Chicago & Northwestern Railway.

The Chicago & Northwestern is using a trestle in the boiler shop at West 40th street, Chicago, which has been found to be a useful device, especially for shops having no overhead cranes. The first trestle of this kind was built and patented by Mr. David L. Wiley, formerly employed at the Chicago & Northwestern shops, but now foreman of boilermakers at the Ashley shops of the Central Railroad of New Jersey. This first trestle was a rather crude device, but the one shown by the accompanying engravings was designed by the mechanical department of the Chicago & Northwestern, and it is quite evident that the details have all been carefully worked out.



Details of Ratchet—Boiler Shop Trestle.

With this arrangement the boiler is supported at two points, one at the back and one just forward of the firebox, in such a way that the boiler can readily be turned so that no overhead work is necessary. This enables the men to do better work and more of it.

The construction of the forward trestle is clearly shown. It will be seen that it is framed of timbers, and that the boiler rests on two small rollers, which are free to turn on short shafts. The shafts are kept in place by recesses in the upper timbers. The rear trestle is made of a 6-in., 14¾-lb. steel I-beam, bent in the form of an arch, which is strongly connected to 6-in. x 6-in. bottom timbers and braces. The rear end of the boiler is carried by a 4-in. wrought iron pin journaled at the top of the arch; this pin has a base 1 in. thick by 18 in. square, which forms a plate that may be bolted to the back head by drilling out a few staybolts. An extension of the pin has keyed to it a 36-in. worm wheel, which meshes with a worm on a horizontal shaft supported by the arch, and by means of an ingenious form of double-pawl ratchet on the end of this shaft the boiler can readily be turned to either side. The details of the ratchet are given by the drawings, which clearly show how it is made, but we believe this ratchet was first used by Mr. C. S. Needham, General Car Foreman of the Wabash, several years ago.

As previously stated, this arrangement has been found very useful for boiler shops, and the same scheme can probably be applied in other places where overhead work is now being done.

A Heavy Consolidation Locomotive for the Lehigh Valley.

We give below the principal dimensions of a very powerful consolidation locomotive (compound) recently built by the Baldwin Locomotive Works for the Lehigh Valley Railroad. The engine is designed for use on the mountain cut-off east of Wilkesbarre. It has a guaranteed hauling capacity of 1,000 net tons, exclusive of engine and tender, on the grades up the mountain, at an average speed of seventeen miles an hour. These grades are about uniform at 62 ft. to the mile. The weight and general dimensions follow:

Compound Consolidation Locomotive—Lehigh Valley Railroad.

Diameter of cylinders	18 in. and 30 in.
Stroke	30 in.
Valve	Balanced piston
Diameter of boiler	80 in.
Thickness of sheets	⅞ in.
Working pressure	200 lbs.
Fuel	Hard coal
Material of firebox	Steel
Length	120 in.
Width	108 in.
Depth	Front, 62⅝ in.
"	Back, 60⅛ in.
Thickness of sheets	Sides, ⅜ in.
" "	Back, ⅝ in.
" "	Crown, ½ in.
" "	Tube (F), ¾ in.
" "	" (B), ½ in.
Number of tubes	511
Diameter	2 in.
Length	14 ft. 7¾ in.
Heating surface, firebox	215 sq. ft.
" " tubes	3,890.6 sq. ft.
" " total	4,105.6 sq. ft.
Grate area	90 sq. ft.
Diameter of driving wheels	55 in.
Diameter of driving centers	49 in.
Journals	9 in. x 12 in.
Diameter of truck wheels	36 in.
Journals	6 in. x 12 in.
Driving-wheel base	15 ft. 0 in.
Total engine wheel base	22 ft. 10 in.
Weight on drivers	202,232 lbs.*
" on truck	22,850 lbs.*
" total, engine	225,082 lbs.*
" total engine and tender	346,000 lbs.
Tender—Diameter of wheels	33 in.
" journals	5 in. x 9 in.
" tank capacity	7,000 gals.
" weight empty	45,250 lbs.

*Weight includes water in boiler, but without fire and men.

For Paris Underground Railroads.

After nearly thirty years of waiting the Metropolitan Railroad of Paris is about to begin the construction of 33½ miles of underground electric roads, consisting of two lines east and west and two lines north and south, with a circular line through several of the principal boulevards. It is expected that a part of this will be completed before the Exposition in 1900. If the plans as given in the Moniteur Industriel of Aug. 29 last are carried out there will be an expenditure on the work during the next ten or fifteen years of nearly $40,000,000. It was at first proposed to build the lines by contract, but the city has now undertaken the work, and it is expected that a saving of about 17 per cent. will result. This course was also adopted in order that there might be no delay in the completion of the work. The following is a translation of the article referred to above:

Seven-tenths of the work will be underground, and the remainder about equally divided between viaducts and open trenches. The grades reach 4 per cent., and some of the curves have a radius of 75 meters (246 feet). It is hoped to complete the first three lines by the year 1906 and the remainder five years later. The expense will be about 200,000,000 francs, but since the project was proposed the gage has been changed to 1.44 meters (4 ft. 8½ in.), which

will cause a considerable increase in the cost of the work, but, it is expected, will increase the value in as great a ratio. It may be questioned whether so much of this subterranean construction was necessary except in the heart of the city. In the suburbs, where there is no crowding and where overhead wires would not be particularly dangerous, it would seem that the trolley road might have been adopted with a great saving in cost. The trains will be composed of four to six cars each, one-half of which will be motor cars and the rest trailers, and will accommodate two to three hundred passengers each. The expected speed is 36 km. (22½ miles) per hour between stations and from 16 to 18 km. (10 to 11 miles), including stops. It was proposed in the beginning to work these lines

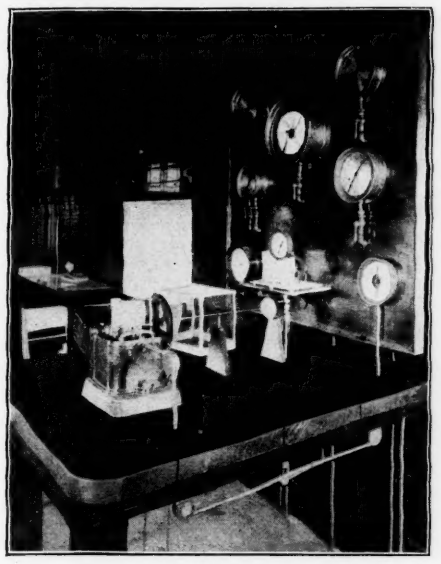


Fig. 1.—Recording Apparatus.

in sections, each to some extent independent of the others, but it has now been determined to run the trains continuously, which permits a considerable increase in the number of trains which can follow each other with a headway of two minutes. The fare will be uniform for any distance (as is customary in Paris). It will be .25 f. for first class and .15 f. for second class and .20 f. for a ticket to go and return before 9 a. m.

The lines will be leased for 35 years to a company with a capital of 25,000,000 f., which will furnish the contract, power plant, rolling stock, etc. It is estimated that the expenses of these installations will be between 50,000,000 f. and 60,000,000 f. The cost of working will probably be from 15 to 18 million francs a year. The company will pay over to the city of Paris one-half of its gross receipts, and in order that there may be a profit the cost of working must be less than half of the gross receipts, and the expenses will not be met unless the traffic reaches 150,000,000 to 180,000,000 passengers. Beyond this number there will be a profit, which will increase rapidly with the increase in the number of passengers.

Performance of Locomotives with Short Front Ends.

In our issue of June 17 last we illustrated the short front end and spark arrester devised by Mr. W. P. Coburn, Assistant Master Mechanic of the Chicago, Indianapolis & Louisville, and stated that this arrangement has been applied to 20 locomotives on that road. Twenty more engines have since been equipped, and it is the intention to reduce the length of the smoke boxes of all locomotives and put in spark extinguishers as fast as the engines are taken into the shops. This is being done because it is found that the short front ends are less expensive to maintain, as they are self-cleaning, the steaming qualities of the boilers are improved, while an important direct saving is effected in the cost of adjusting damage claims arising from fires started by locomotive sparks. Mr. Coburn states that during the past 14 months there has not been a single case of a locomotive fitted with the new spark extinguisher having started a fire.

The general average fuel record in freight service for six months of this year, compared with the corresponding time of 1897, when only a small number of engines had the new front ends, is as follows:

Months.	Average Pounds of Coal Per Loaded Freight Car Mile. 1898.	1897.
April	6.27	6.70
May	6.23	6.68
June	6.25	6.70
July	6.44	6.58
August	6.49	6.74
September	6.34	6.58

It will be seen that an appreciable fuel saving has been made when considered on a car-mile basis, although during the present year the weight of freight trains has been materially increased on the Chicago, Indianapolis & Louisville by the adoption of the tonnage system of rating locomotives. As the fuel records of previous years were kept on a car-mile basis, the records of this year have been reduced to that unit, although the comparison in this way does not clearly show either the total effect of the new front end device or the saving due to the increased weight of trains. In fact, even if the coal burned per car-mile in 1898 had been somewhat more than in 1897 when figured on a car-mile basis, it is reasonable to suppose that were the performance reduced to a ton-mile basis an improvement in the fuel account would be shown, because of the increased train loads. That a better showing is made this year than last on a car-mile basis would therefore indicate that the short front ends improve the performance of the boilers, which for some time past has been the contention of Mr. J. Snowden Bell, and others who have made a careful study of the draft appliances for locomotives.

A New Dynamometer Car.

Through the co-operation of Mr. J. A. Barnard, General Manager of the Peoria & Eastern Division of the Cleveland, Cincinnati, Chicago & St. Louis, and Prof. L. P. Breckenridge, head of the Department of Mechanical Engineering at the University of Illinois, a new dynamometer car has just been built by the railroad and equipped by the University, to be used for the mutual advantage of both parties. The car was built at the Urbana Shops, under the supervision of Mr. J. McClurg, Master Mechanic, and the apparatus was installed by Asst. Prof. Van Dervoort, of the Mechanical Engineering Department of the University. This is a way car, equipped with four wheel passenger trucks; it is 36 ft. long, weighs 36,000 lbs., and is neatly finished inside and arranged for comfort and safety. Several runs have already been made with very satisfactory results.

The object sought in the design of the car was, first to provide more satisfactory and safer means of making locomotive road tests than is ordinarily provided when all the observations are made from the locomotive itself; and, second, to provide suitable automatic apparatus for recording the pull at the draw bar of the tender. Also, by mounting a considerable number of the instruments in the car, it saves changing them from one locomotive to another, and at the same time they can be more carefully mounted and more accurately read.

The records which are automatically recorded on suitable charts are: Boiler pressure, speed in miles per hour, pounds pull on the draw bar and the time of passing mile posts. The records which are at present recorded by observations from instruments mounted in the car are: Steam chest pressure, pounds of water delivered to the boiler, the number of revolutions of the drivers per minute, the air pressure in the auxiliary reservoir, and the air pressure in the train pipe. The car is to be supplied with a switchboard and a complete set of electric signal bells, and arrangements are being perfected for recording on a special chart many other observations not included in the above list, such as: Time of taking indicator diagrams, position of reversing lever, position of throttle valve, temperature of escaping gases, bags of coal delivered to the fireman, direction of the wind and the velocity of the wind, thus leaving but few observations to be taken directly by individuals, and

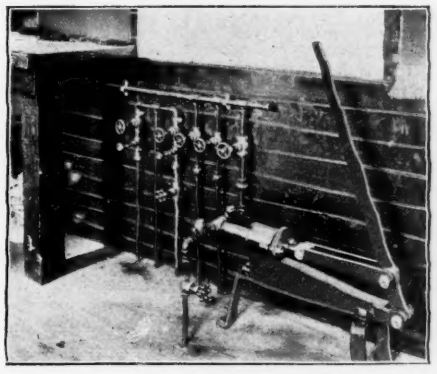


Fig. 2.—Oil Pump and Connections.

requiring not over three men on a locomotive during a test, namely, two at the indicators and one in the cab at the calorimeter.

Two views of the interior are given in Figs. 1 and 2, which show the general arrangement of the apparatus. The Boyer speed recorder is driven in the usual manner from the axle of the car, while the drum of the Metropolitan recording gage is also driven from the same connection, the clockwork having been removed and suitable gearing interposed. On this drum is recorded the pull on the draw bar.

The general arrangement of the dynamometer cylinder and connections is clearly shown in Fig. 3. The cylinder is securely fastened to the center sills, and the piston rod is attached to the draw bar through a cross head in such a way that when the space in front of the piston is filled with oil none of the load is carried by the buffer springs, but when the oil is discharged the pull is taken by the springs in the usual manner, the piston moving up nearer the front of the cylinder; under no circumstances can the piston strike either cylinder head. The cylinder is 8 in. in diameter, and the piston and piston rod are packed with cup and U leathers respectively. The cylinder is filled in front of the piston with oil, so that the pull on the draw bar is taken by the oil and the pressure per square inch recorded by the gage shown in detail in Fig. 4. This gage is graduated to 1,000 lbs., and the drum is about 5 in. in diameter, and moves past the recording arm at different speeds depending upon the gearing, 6 in. per mile being the fastest rate that has so far been used. The second hydraulic gage, which is attached to the same pipe, is graduated so as to indicate directly the total tons pull on the draw bar.

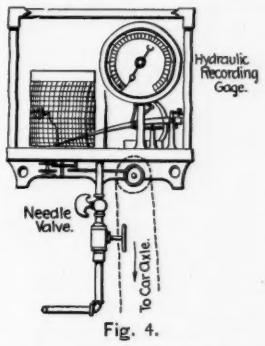


Fig. 4.

When not in use the oil is stored in the tank in the upper part of the car. From the tank it can be forced into the dynamometer cylinder by the hand pump shown, and it can also be raised again into the tank, by allowing air from the auxiliary reservoir to enter the cylinder from above by the pipes shown. Any oil leaking past the piston may also be raised into the tank in the same way. This is rendered possible by the arrangement of the piping and the valves. The duplex air gage is connected to both train pipe and auxiliary reservoir. The two air vent cocks near the globe valves in the air pipes are allowed to remain open when testing, as it assures that the air pressure will not act on either side of the piston.

The variation of the recording pen during a recent pulling test was not over 5 lbs. at speeds above 12 miles per hour. For slower speeds there was more variation, corresponding to the actual conditions, while at the lowest speeds the revolutions of the engine could be counted on the diagram. A change in

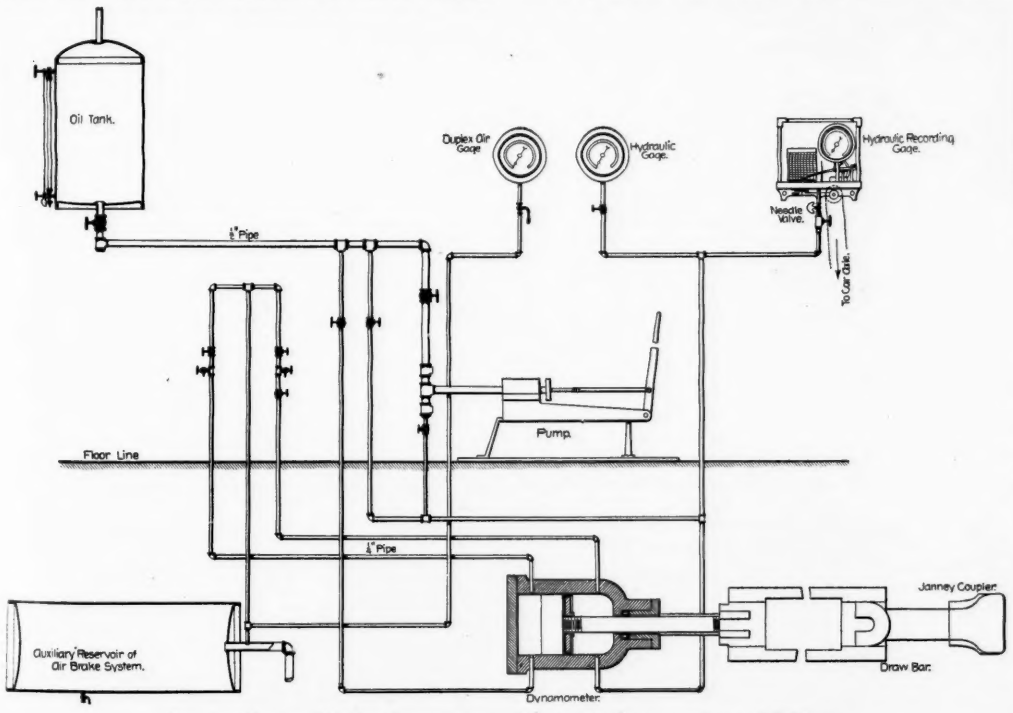


Fig. 3.—Diagram Showing Arrangement of Hydraulic Dynamometer and Fittings.

the position of the reversing lever or throttle valve makes a noticeable change in the diagram. No attempt has as yet been made to calibrate the dynamometer, but it is the opinion of Prof. Breckenridge that the frictional losses are very slight. The gage pointer moves back and forth all the time slowly and without vibration. The piston itself has a continual slight motion, due to variations in the pulling force and vibrations of the car itself. When pulling the dynamometer car alone a record is made on the gage, showing that the dynamometer is sufficiently sensitive for all purposes.

The Canadian Bonding Privilege.

[Condensed from an article in the Toronto Globe.]

Shortly before the International Commission adjourned, representatives of the Atchison, Topeka & Santa Fe, acting in behalf of the transcontinental railroads of the United States, appeared at Quebec, and prevailed upon the American Commissioners to advance the proposition that the Canadian Pacific and the Grand Trunk should be placed under the Interstate Commerce Act. This done, the American transcontinental lines would have no objection to the bonding privilege being made secure by treaty. The bonded traffic carried by Canadian railways is divided for the sake of convenience into two parts, the foreign and the domestic. The foreign is the traffic between Canada and Europe, over American territory, and that between the United States and Europe over Canadian territory; also traffic between Canada and the West Indies, Argentine and Brazil, through American ports, as well as traffic between Canada and Australia, together with traffic via Canada between the United States and such countries as China and Japan, and between Canada and China and Japan, via the United States. The domestic trade consists of the states-to-states traffic carried through Canada, and the province-to-province traffic carried through the United States.

The treaty of Washington of 1871 guaranteed both the foreign and domestic trade for certain periods. Some think that the guarantee still applies to the foreign transit trade, but all agree that it has ceased in the case of the domestic, which is now carried on solely by virtue of legislation passed by the two countries prior to the treaty. The bonding of what was known as "amphibious traffic" under article 30 of the treaty of 1871 was stopped by the United States some years ago.

Statistics of the bonded traffic as a whole can scarcely be said to exist, but from the best information at hand it seems beyond doubt that the foreign transit trade done by Canada through American territory is considerably greater than the foreign transit trade done by the United States through Canada, Canada being dependent, especially in winter, on American seaports. On the other hand, the states-to-states traffic carried from one point in the United States to another through Canadian territory by Canadian railways greatly exceeds the province-to-province traffic carried by American roads through American territory.

The Treasury Department at Washington reports that during the calendar year 1897, 5,350,000 tons of domestic merchandise were transported in bond through Canada from one point in the United States to another. The bulk of this was carried between the Western and Northwestern states on the one hand, and New England and New York on the other. Ontario and Quebec lie directly in the path of communication between those two sections of the United States, so that the Canadian railways are employed almost as a matter of necessity. From information gathered by the writer, it appears that of the 5,350,000 tons 2,000,000 tons were carried by the Michigan Central, an American corporation; 3,000,000 tons by the Grand Trunk, and 350,000 tons by the Canadian Pacific. The notion that the Canadian Pacific has been enjoying the lion's share of this traffic is thus shown to be erroneous. The Canadian Pacific spends more on the purchase of American rails, cars, air brakes, coal and other products of American labor for use on its lines within Canada than it derives in the form of earnings from all the states-to-states traffic it hauls.

The Canadian Pacific probably would not suffer if the bonding system were destroyed root and branch. At present, the greater part of the Manitoba wheat crop goes to Europe by Buffalo and New York. It is carried in American bottoms from Fort William to Buffalo, and shipped thence by rail to New York. The rail rates between those two points are exceedingly low. With the bondage privilege abolished, this large traffic would be left in Canadian hands and be carried to Montreal and St. John, N. B.

The Grand Trunk would undoubtedly be hurt. The loss of 3,000,000 tons of states-to-states traffic could not be made up from Canadian sources; in fact, the Grand Trunk as a through route between Chicago and Portland would be well-nigh annihilated. It was not surprising, therefore, to find the Grand Trunk coming to Quebec and expressing its willingness to accept the proposal for placing the two Canadian roads under the jurisdiction of the Interstate Commerce Act. Its alliance with American roads, notably with the Wabash, would serve to some extent to protect it from hostile action.

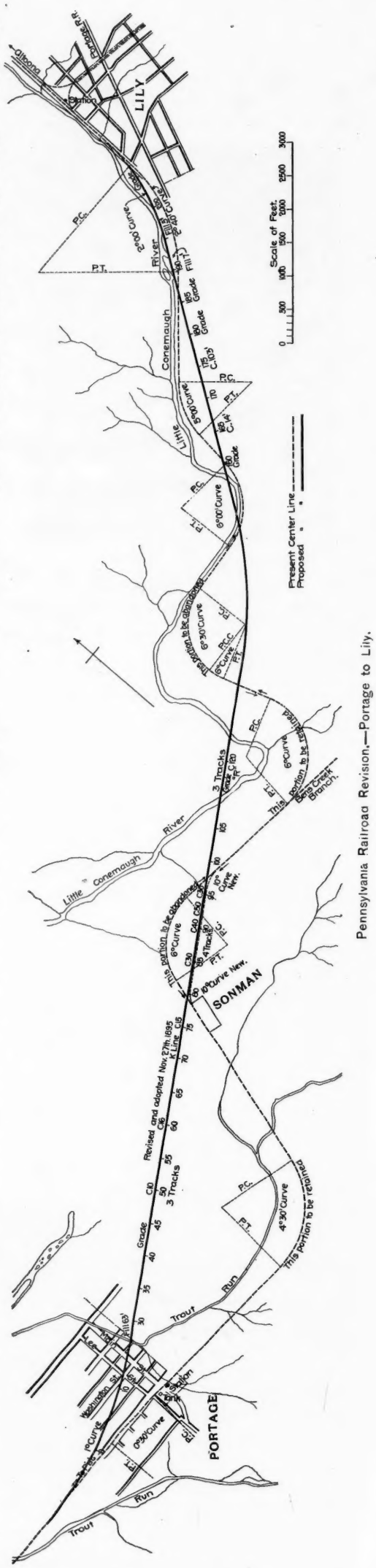
The states-to-states traffic carried by the Grand Trunk amounts as a rule to over 30 per cent. of its entire business within Canada. Sir Joseph Hickson told the Royal Commission on Railways in 1888 that "the payments by the Grand Trunk in Canada in working the through traffic have not been less than $4,000,000 annually for the past four years; and," he added, "the effect of such an expenditure in employment and the consumption of supplies must have been very beneficial." Further, the foreign traffic had enabled the Grand Trunk to largely extend lines in local districts.

The Canadian Commissioners should note that the proposition made by the Atchison is a violation of sovereignty. Both Canadian roads already have lines in the United States, and are in a sense under two flags. Both observe the principles of the Interstate Commerce Act as a matter of voluntary obedience. But now the Canadian Commissioners are asked to give the Interstate Commerce Commission specific jurisdiction over traffic passing through Canada. This would be intolerable. It is no secret that the Atchison and other transcontinental roads in the United States desire to see the Canadian Pacific placed under the jurisdiction of the interstate act, simply and solely that they may thereupon get Congress to license it, the license being revokable by the Interstate Commerce Commission; but with a license repealable at any moment the Canadian Pacific would be in the position of a toad under a harrow, for its American rivals would leave nothing undone, we may be sure, to convict its agents of breach of the interstate law. Of course, if the license were once suspended, if only for a week or a month, the road might as well go out of business. Under the most favorable circumstances shippers would hesitate to bill goods over a line whose bonding privileges rested on so frail and uncertain a tenure.

Colonel Walker, who appeared at Quebec for the Atchison, had no sooner laid his proposal before the American Commissioners than Hon. Charles S. Hamlin and Mr. Albert Clark, representing Boston merchants, made rejoinder substantially to this effect: "Colonel Walker represents a railway with a capital, perhaps, of $250,000,000. We represent 2,000 merchants and manufacturers of New England, with over $700,000,000 of capital—not watered—and employing tens of thousands of people. We market our goods all over the world, and want the greatest possible competition in the means of collecting our raw material and distributing the finished product. The Canadian roads are an immense help to us; they regulate rates between the Western states and New England. We insist that there shall be no interference with the bonding system, which is already amply protected by law, and which, therefore, need not be discussed by this commission at all. The Canadian roads long since agreed to be governed, in regard to business originating in the United States and destined to other points in the United States, by the laws of the Interstate Commission. Colonel Walker's purpose is quite obvious. An American road violating the interstate act is fined, but he proposes a different penalty altogether for Canadian roads. . . . We therefore urge the American Commissioners to let the bonding arrangements alone, and not play into the hands of the American lines that are seeking to efface Canadian competition."

Such is the view of New England, whose interests at Washington, as Mr. Clark said, are quite powerful enough, in conjunction with those of the Western and Northwestern states, to protect the bonding system without the assistance of a treaty. It would be a blunder of the first magnitude for the Canadian Commissioners to accept the Atchison's proposal.

The truth about the Canadian Pacific is that its competition has been, is, and always will be, formidable to its American competitors, because it is well and economically managed, and traverses a new empire whose agricultural and mineral wealth is being rapidly developed. It is one of the few roads in the world which own and operate their own ocean steamships, lake steamers, grain elevators, sleeping cars, dining cars, telegraph and express lines, the profits from these sources in 1897 having exceeded the interest on the whole of the consolidated debenture stock of the company. . . . If some good fairy were to build a transcontinental road to-morrow without the cost of a dollar to the United States, in what way could its competition with the existing lines prove injurious to the interests of the American people? It is said that the Canadian Pacific has been bonused by the Dominion. But some of the American transcontinental lines have been bonused also, and Canadians actually bonus American roads, for the express purpose of enabling them to compete to better advantage with Canadian roads. Thus the Northern Pacific owns 270 miles within Canadian territory which have received a large cash bonus from the Manitoba treasury; . . . the Canada Southern, now owned by the Michigan Central, was bonused by the Dominion Government, by the Provincial Government of Ontario and by Ontario municipalities. The Canadian people welcome railway competition from any quarter; and the fact that, notwithstanding the efforts of the American transcontinental roads to get it to legislate against the Canadian Pacific, Congress has steadily set its face against any action in that



direction, goes some way to show that the American people are of the same mind.

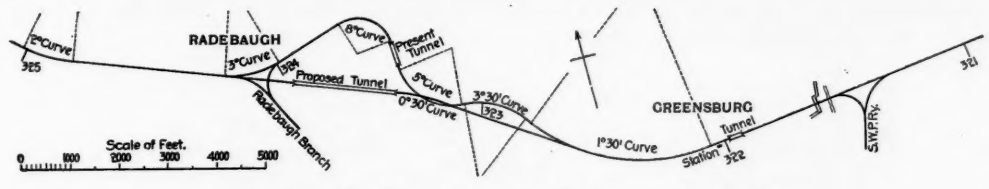
The writer then goes on to argue against the proposal to establish an international commission. Such a body could not do effective work; if evenly constituted there would be a deadlock, and of course neither side could tolerate a majority in the opposite side. The safe policy for the Canadian Commissioners is, as suggested by Messrs. Hamlin and Clark, to let the bonding privilege alone, and leave the good sense and self interest of New England and the West to protect it from the attacks of its enemies.

New England being thus a friend of the Canadian roads, Canada should be more friendly to New England, and allow fishermen from those states to ship their deep sea catch in bond at Canadian ports. At present the New England fishermen thus shipping have to pay an annual tonnage tax to the Dominion. The objections of Nova Scotia fishermen should not control; they make nothing by excluding the New Englanders from the desired privilege, and would lose nothing by granting it.

Changes of Line on the Pennsylvania.

The plans which are published herewith show two of the changes now going on in the alignment of the main line of the Pennsylvania Railroad. The first covers the line between Lilly and Portage, about 4.5 miles. The old line and the new line are very clearly shown on the plan. The curvature and the cut and fill are indicated. The revision will save 1.11 miles in distance and 444° of curve. The revised line will have a uniform ascending grade eastbound of about 0.4 per cent. It involves four new crossings of the Little Conemaugh River, and of course it requires some heavy work, otherwise the old line would never have been located where it is. The new work is nearly all in cutting, the cuts running from 120 ft. down through 105 ft., 80 ft., 50 ft., etc.

The other plan shows the revision between Greensburg and Radebaugh, the important change here being made by means of a tunnel 2,100 ft. long. The new line will save 233° of curvature and 1.100 ft. distance. The tunnel is through a point which rises about 175 ft. above the present grade, and the section indicates that the work will be through some pretty bad material. There are strata of shale, sandstone, slate, coal, limestone, soapstone, bastard fire clay and boulders. The grade through this tunnel will be on a vertical curve, the summit of which will be about the middle.



Revision of the Pennsylvania Railroad's Line near Radebaugh.

A Test of the Peckham Truck.

The Peckham Truck & Motor Co. has recently taken a contract to furnish trucks for the South Side Elevated Railroad of Chicago. In order to demonstrate the strength of the structure, a test was made at the works in Kingston on Monday of this week under the auspices of the R.W. Hunt Co. The truck tested is the one known as the extra strong 14A truck, and is shown in the accompanying reproduction of a photograph.

The pedestals and all other castings, with the exception of the side bearings and center plates, are of malleable iron. The pedestals rest upon the oil boxes through the intervention of a short helical spring. The side pieces are formed of four bars of flat iron, riveted to the pedestals and placed in pairs to take the compression and tensile stresses of the imposed load. The upper bars are of 3½ in. x ⅞ in. steel, and the lower of 3½ in. x 1 in. At the center there is a malleable casting riveted to both pairs of bars so that any defection must be the same in both pairs, in addition to which diagonal braces are also interposed. This center casting is so arranged as to afford a means of riveting the ends of the transom bars in position. These are of 5½ in. x 1 in. steel and are braced and held square by diagonals running from the upper side bars. A spring support of 4½ in. x 1 in. steel is swung from the transoms by hangers about 18 in. in length, by which an exceedingly easy motion of the truck is obtained. The bolster, which is formed of two 8 in. x 2¼ x ⅜ in. channels, held by a top plate of 6 in. x ¾ in. steel, rests upon the spring plank through the intervention of helical springs at the ends and a semi-elliptic spring in the center.

This description covers that portion of the truck which carries the load and is called upon to sustain the running stresses. The cantilever or overhanging portion is formed of bars of the same size as the upper side bars, and is braced by a malleable iron strut. The bars are carried across the ends of the car and from them is suspended the brake rigging.

In testing the truck the two side frames constituted the parts subject to the stress. The work was done by laying two of them across an hydraulic press with the openings of their pedestals opposite to each other. The jaws of these pedestals were solidly blocked and bolted, so that the stress was brought upon the castings in the same way as in the loading of the car. The top of one center casting rested against the tail piece of the press and the other was acted upon by the ram. The loads applied were increased by increments of 10,000 lbs. until rupture took place. In the making of these tests the total deflection and set of the two side frames was measured. Averaging these, the following results for each frame was obtained:

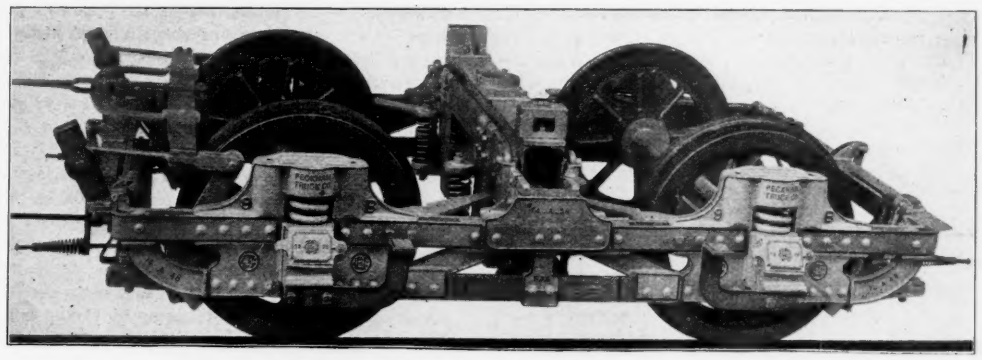
Load in lbs.	Total Deflection in inches.	Total Permanent Set in inches.
10,000	.0	.0
20,000	.0	.0
30,000	.02	.0
40,000	.05	.0
50,000	.09	.0
60,000	.125	.03
70,000	.215	.10
80,000	.240	.13
90,000	.320	.17
100,000	...	..
102,000	...	Fracture

The fracture occurred through the center of the rivet holes holding the malleable iron diagonal strut that rises from the lower to the upper side bar. The fracture in the lower bar was through the rivet hole next the truck center; that of the upper bar, through the hole just outside the center casting.

In considering the strength of these trucks in comparison with the work which they will be called upon to perform, we find that the latter is well within the elastic limits of the framing. The weights which will be put upon the truck may be taken to be:

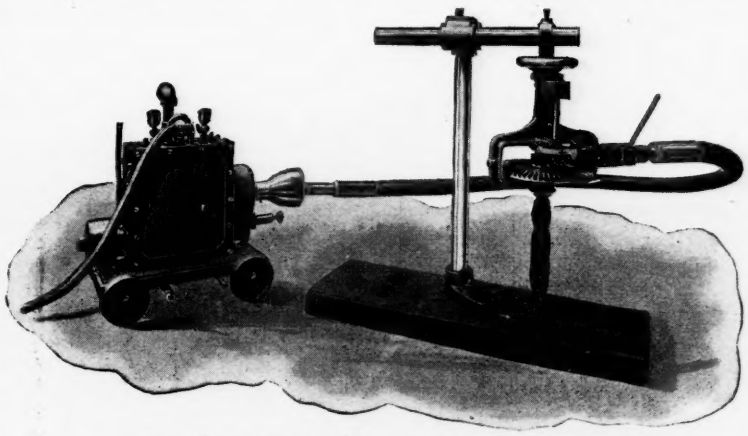
Weight of motors	6,000 lbs.
" " car body	20,000 lbs.
" " passengers	15,000 lbs.
Total weight on trucks	41,000 lbs.
Weight on each truck	20,500 lbs.

From the test that was made it will be seen that the elastic limit of the truck is about 100,000 lbs. That is, each side frame is capable of carrying 50,000 lbs., or 100,000 lbs. for the two. Hence the working factor of safety inside the elastic limit is a little more than four and seven-eighths; or, if the point of failure of the truck be taken as the base, the factor of safety becomes about 10.75. If to the static load we add 50 per cent. for running stresses, the load becomes 30,000 lbs., still leaving a factor of safety of 3.33. This will be found to be more than that which has been found to be necessary in the case of trucks upon steam roads. We have no data at hand as to what this may be for passenger trucks, but, in the case of the diamond truck in freight service, a fair average of strength may be said to be from 2 to 2¼ inside the elastic limit of the structure, when based upon the running stresses to which it is subjected. The test may, therefore, be said to have removed any doubts that may have existed as to the capability of the truck to carry the load that will be put upon it, and has shown that it will not only do that, but that it has an ample margin for stresses that may be imposed by the inequalities of the track.



Peckham's "14A" Truck for the Alley Elevated of Chicago.

As we have said, the tests were made in the shops of the company at Kingston, and were witnessed by a party of 18 engineers who went there in a special car and as guests of the manufacturing company.



Portable Air Motor for Driving the Stow Flexible Shaft.

A Portable Air Motor for Flexible Shafts.

The reader is of course familiar with the Stow flexible shaft and its methods of drive by means of rope and by electric motors. The company believes that compressed air has advantages over electricity for this work, particularly in places where air power is used for general purposes, as for pneumatic tools.

The motor is here shown mounted on wheels, so as to be easily rolled to any point and rest on the floor; but it is also provided with an eye at the top, so that it can also be suspended from above. The flexible shaft is attached directly to it by means of the universal joint, and can thus be applied to any kind of tool, and made to do any kind of work ever done by this popular and convenient appliance. This compressed air motor is of the oscillating cylinder type, and is provided with gearing for changing speed, so that its speed of 1,000 to 1,200 revolutions a minute can be reduced to any speed desired.

The compressed air motor takes air from any tank through a hose, and can be placed in almost any conceivable position to suit the work called for. This motor increases the usefulness of the flexible shaft, making it especially convenient and serviceable in machine shop work.

Foreign Railroad Notes.

The Vacuum Brake Co., represented in Vienna by Hardy Borthers, advertises that in Germany at the end of last year its brake was used on 462 railroads, and that 50,594 locomotives and 131,137 cars were equipped with it.

The first Prussian railroad, from Berlin to Potsdam, 16 miles, was opened 60 years ago, and the opening excursion trip was made Oct. 29. The anniversary moves some one to recall the remark of the Prussian Postmaster General of the time, one von Nagber, when the project was submitted to him: "All nonsense! I dispatch several six-seated coaches every day to Potsdam, and nobody rides in them. And now they want to build a railroad there! If, gentlemen, you are absolutely determined to get rid of your money, better throw it out of the window than spend it in such foolish enterprises!"

Three popular German comic newspapers are no longer to be sold at the station newsstands of the Prussian State Railroads, by order of the Government. Considerable criticism has resulted, on the assumption that the prohibition was due to satire of the Government or some of its methods. Not all of the papers were radical, and one was called conservative. Answer from what may be supposed to be an officially inspired source is that two of the forbidden journals were nasty, and the other too disrespectful.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The Air Brake and the Big Car.

The introduction of cars of 100,000 and 110,000 lbs. capacity has produced several new problems, both for the car builders and the operating department. One of the first things to which attention was directed, on account of this increase in load, was the strength of the body and truck bolsters, and this subject has now been so generally discussed that, in the future, the bolsters will probably be among the first details to receive attention in making specifications for new cars. The need of larger center plates so as to prevent excessive wear of these parts has become more apparent, but so far, except in a few instances, the design of the center plates has not had the attention which it will probably receive later.

Another problem, which is now being studied, and which could be discussed with advantage in the railroad clubs, is how sufficient braking force can best be obtained with mixed trains of loaded and empty cars of large capacity, and also with mixed trains made up of 100,000 lbs. cars and cars of, say, 60,000 lbs. capacity. Merely to show the importance of this question and how it has come about, it may be well first to state that the accepted rule provides that the braking force used with freight cars should not exceed 70 per cent. of the light weight of the car. This rule, while providing a braking force smaller than could safely be used were the cars always run loaded, insures that the wheels of empty cars will not be skidded during an emergency stop under ordinary conditions of rail. As is probably well known, the light weight of freight cars in this way has determined the safe allowable braking force.

Attention is called to the following table, which gives the average weights of three different classes of cars. The average weight of the 100,000 lbs. capacity cars has been taken as 30,000 lbs., as this weight has varied in cars built up to the present time between 26,000 and 34,000 lbs.

Capacity. Lbs.	Light Weight. Lbs.	Total Weight. Lbs.	Allowable Braking Force. Lbs.	Ratio of Breaking Force to Total Weight.
40,000	22,000	62,000	15,400	.25
60,000	29,000	89,000	20,300	.23
100,000	30,000	130,000	21,000	.16

It is evident from the figures given that in passing from cars of 40,000 lbs. capacity to those of 60,000 lbs. the question of braking force was one of little importance, and no changes were necessary in the operation of the brakes. But it is quite obvious that under the same conditions the length of a stop with a train of cars loaded with 100,000 lbs. each would be seriously longer than a similar stop with a train of cars each loaded with 60,000 or 40,000 lbs. In fact, it has been found in many instances difficult to handle trains of large capacity cars on even moderate grades.

On the Lake Superior and Ishpeming, where the cars always move one way and down grade when loaded with ore and are returned to the mines empty, this question of braking power has been neatly solved. Instead of one pressure regulator, two are provided, as with the high-speed brake, one being set at 70 and the other at 100 lbs. per sq. in. When a loaded train is being hauled, the engineman, by turning a cock, cuts out the regulator set at the lower pressure, so that the high pressure regulator governs the pressure of the reservoir and train line; when returning with empty cars the low pressure regulator is cut in and maintains the reservoir pressure at 70 lbs. per sq. in., or the standard pressure. This method has worked satisfactorily on the road named, where the conditions are exceptional, but evidently it could not be used were the trains made up of both loaded and empty cars.

Another road, after making a number of trials with trains made up of loaded and empty cars of large capacity, found that such trains could be readily handled on heavy grades by increasing the reservoir pressure, and then cutting out the brakes of all empty cars. This at present seems to be the most practical solution of the general case, but several objections to it will at once occur to the operating officer.

The Two Heaviest Locomotives.

The Railroad Gazette of Oct. 28 illustrated and described the largest locomotive in America (possibly in the world), and the Revue Générale des Chemins de Fer for October performed the same services for the largest locomotive in Europe. The American engine was built by the Pittsburgh Locomotive & Car Works for the Union Railroad, and the European locomotive was exhibited at the recent exposition at Brussels and belonged to the Belgian State Railroad. As these two locomotives were both designed for freight service on heavy grades, and as their weight is about the same, a comparison is interesting.

The heaviest grade on which the American engine must work is 2.4 per cent., and that for the Belgian engine 3.1 per cent. While the American is of the consolidation type, the Belgian has six driving axles. The first three are on a truck, with the cylinders connected by means of flexible joints (as in the old Fairlie engines), and the rear three axles are rigid in the frames. Thus, while the services required are similar, the Belgian engineers have adopted an entirely different and a more expensive method of attaining their results. The engine is really a four-cylinder compound, the two high-pressure cylinders being applied to the rear set of drivers, and the low pressure to the drivers set in the truck. This has the advantage of using solid steam pipe connections for the high pressure, and the flexible joints for the reduced pressure, bringing the exhaust under the stack, as desired. We tabulate below the principal dimensions and weights of these locomotives:

Data.	American.	Belgian.
Gage	4 ft. 8½ in.	4 ft. 8½ in.
Weight on drivers	208,000 lbs.	218,255 lbs.
" " truck	22,000 "	.....
" total	230,000 "	218,255 lbs.
Tractive power	53,292 "	29,700 "
Wheel base, total	24 ft. 0 in.	30 ft. 7½ in.
" rigid	15 ft. 7 in.	9 ft. 10 in.
Center of boiler above rails	9 ft. 3⅜ in.	8 ft. 2⅛ in.
Top of stack above rails	15 ft. 6 in.	14 ft. 5 in.
Heating surface, firebox	205.5 sq. ft.	159.5 sq. ft.
" " tubes	3,116.5 "	1,574.5 "
" " total	3,322 "	1,734 "
Grate area	33.5 "	86 "
Drivers, number	8	12
" diameter	54 in.	51¼ in.
Cylinders, diameter	23 "	19¾ in. and 32 in.
" stroke	32 "	25½ in.
Valves	Bal. slide.	Piston.
Boiler pressure	200 lbs.	220 lbs.
" diameter at front ring.	80 in.	60½ in.
Tubes, number	355	164
" outside diameter	2¼ in.	2¾ in.
" length over sheets	15 ft. 0 in.	13 ft. 6 in.
" kind	Plain, iron.	Serve, brass.
Firebox, length	10 ft. 0 in.	9 ft. 8 in.
" width	3 ft. 4¼ in.	8 ft. 9 in.
Smoke box, length	68⅝ in.	79 in.
" diameter	83¾ in.	62 in.

The great discrepancy in the tractive power is caused by the early cut-off used in the compound engine. Using the formulæ $\frac{p\ d^2\ s}{D}$ and $\frac{2\ p\ d^2\ s}{(r+1)\ D}$ for the simple and compound engines, respectively, where p = boiler pressure, d = cylinder diameter (low pressure in compound), s = stroke, D = diameter of drivers, and r = cylinder ratio, we get a theoretical tractive power of 62,000 lbs. for the American and 56,000 lbs. for the Belgian locomotive. These values are 30 per cent. and 26 per cent., respectively, of the adhesive weights, but as the steam is allowed to follow only about one-third stroke in the compound, the effective pressure is much reduced. The values stated allow a mean effective pressure of 86 per cent. of boiler pressure in the American and about 53 per cent. in the Belgian engine, allowing, of course, for the relative action in the compound cylinders.

Referring to the boiler proportions, it will be seen that the American engine has about twice as much heating surface, the diameter of the boiler being one-third greater and the tubes 18 in. longer. The Belgian engine has Serve tubes, however, and the ribs of these increase the tube heating surface about 90 per cent., the figures given in the table referring to the outer or water surface of the tubes. The grate area is very large, in order to burn a fine and low grade of fuel, and the firebox resembles the Wootten.

Considered as a whole, American practice, at this date, is to put everything into the boiler, making this as large as possible. The Belgian engine has coal boxes and water tanks on each side of the boiler, which, of course, adds to the adhesive weight, but at the same time keeps down the size of the boiler for a given weight. While this dispenses with the extra weight of a tender, yet, as above stated, American engineers prefer to use every available pound in making the boiler as large as possible, as this really governs the work which can be got out of the engine.

Different Views of Pooling.

It is well known that some experienced and conservative railroad traffic officers believe that pooling would not cure more than a small part of the rate-demoralization which now keeps freight earnings at a very low level—in many cases at or below cost. In this respect these officers seem to be standing on common ground with Mr. Milton H. Smith, whose article we printed last week. But they do not really agree with him thus fully, and it is important to note the difference between the two positions.

Mr. Smith argues that the Commissioners could not accomplish their purpose, even if they had what they ask for; hence, why give them the desired powers? This seems a strong argument. It is true that if they did not detect illegal rate cutting better than they do now they could do nothing with their power over any pool except to order its annulment, and thus put the railroads back into the same slough of despond that they now flounder in. But this is not the issue. The Commissioners want the power to regulate tariffs, not particularly for what they could do with the rates on grain and the other commodities which are so fiercely fought for in Chicago-New York territory, and which it is hoped could be regulated by the aid of pools, but for the purpose of dealing with hundreds of cases in other parts of the country, many of them concerning rates on traffic which has never yet been badly blighted by the secret-rate bacillus. The proposition simply contemplates what is substantially a barter; Congress gives the railroads the right to try pools on grain, provisions and other important commodities, and the railroads in return submit to Commission-regulation in a thousand other places. Of course, it is a very crude arrangement, as is likely to be the case with any law affecting contracts in three million square miles of territory. The grain-carriers may enjoy all the advantages and some other road or roads suffer all the disadvantages of the proposed arrangement.

Mr. Smith is so sure that the privilege of pooling would be valueless that he objects to giving the Commission any power whatever. Railroad men who hope to do even a little rate-regulating by means of pools, believe that Congress may properly give the Commissioners at least something. Some say give them what they ask. Others say give them power only over rates on pooled traffic. Mr. Smith evidently thinks even this last is hardly worth while. He says that a railroad which will violate the law will break a contract.

It seems to us that experience does not support this view. Railroads which are popularly supposed to be constantly violating the law are making contracts every day, and carrying them out. If they broke many we should hear of suits in the courts to enforce compliance. A railroad officer who makes secret reductions in rates probably reasons, first, that the evasion of the law is technically non punishable—believes that the courts would not convict him—and so treats his act as in a sense only a violation of the spirit of the law and not of its letter. Believing the law wrong in principle he holds himself to its letter only. Second, if he continues this until he oversteps the bounds, and does what he knows is punishable, he relies on keeping the courts from getting the evidence. Now, this course of reasoning cannot be made to apply in the slightest degree to a written contract binding a road to the payment of certain

definite sums of money to a certain person. The other parties to the contract have copies of it, and the rate-cutting road has property that can be attached. A pool can be cheated by falsifying waybills, and the theory of pooling has certain unsatisfactory features which all admit; but these points do not properly come within the scope of the present discussion. The essential thing to keep in view now is that a contract is different from a criminal statute.

We do not know of any railroad man who desires simply the repeal of the anti-pooling law. Mr. Smith reminds us of the inefficiency of the pools under which the railroads tried to regulate rates before this law was enacted; but everyone knows all about that. Then the courts had no more respect for a pool than for a lottery contract. What is desired now is the right to make a pool which the courts will recognize. At present a pool is made unlawful by statute. Formerly it was made so by the courts declaring it inimical to the public interest. What the railroads want is recognition by Congress of the fact that pools are now believed by the great majority of the wisest men in the business world to be not against public policy.

The right to enforce a pooling contract by law may or may not be a valuable privilege. Competing railroad officers who cannot habitually adjust matters by discussion—after the manner followed during the past two years by the roads in the Joint Traffic and the Southwestern associations—probably would not get much benefit from a pool; and if they do meet together in fair business intercourse, why should they "show their teeth" by threatening to sue one another for breach of contract? A very small exercise of the teeth would in all probability destroy the value of the business discussion. This question suggests a subtle point, the bearing of which can be made clear only by experiment. It is a fact that the roads that carry the traffic which is most fiercely competed for—the principal commodities between the Mississippi Valley and the Atlantic seaboard—cannot hope to moderate their warfare even in a slight degree without patient conferences, held frequently; and patience implies something akin to friendliness and the opposite of warfare. But it is equally a fact that, the competitors being numerous, and agreement on the details of a pool being difficult at best; and every conferree being the representative, to a lesser or greater extent, of some one or few other persons besides himself, a written contract, with a bond, tends to make a rate-conference more likely to amount to something. The old business maxim is that short settlements make long friends. On the same principle a definite contract will add definiteness to negotiations in which otherwise the lack of that quality would be fatal.

We may even say that the enforcement of the bond of a traffic agreement might often promote the welfare of the participating roads, as a whole, notwithstanding the existence of minor elements of injustice in it. The great need at present is to afford to the most intelligent and high minded traffic officers of the country, in their task of conducting a competitive business, which every competent observer admits to be different, in fundamental particulars, from any other large business, all possible facilities for utilizing the best means known for making their competition rational and above-board. Every man whose opinion is based on experience believes that this best means is a pool, or some similar instrumentality for modifying but not destroying competition. The least the Federal Legislature can do is to recognize such a well-settled business proposition by a well-considered statute. In this connection we may note, in passing, that the Sherman Anti-trust law of 1890, under which railroad conferences are deprived of what little efficacy they did possess between 1886 and 1890, is as far as possible from what may be called a well-considered law. It was passed for a definite—indeed, a narrow—purpose; simply to aid the Western farmers to better cope with the speculators in food products at Chicago.

Mr. Smith says that if the railroads would make no secret rates the present demoralization would speedily disappear. Doubtless that is true. But would profits be appreciably enhanced? We believe not. The substitution of regular and public in the place of secret and irregular rates would raise the moral standard of rate making, and it would put small shippers on a basis of equity with large ones, but there is no evidence that it would raise rates up to the present tariffs, or anywhere near them. If one may judge by the strenuousness of the efforts of the trunk lines, both strong and weak, to get a share of the competitive freight at the half dozen principal Western centers, they would fight just as hard for it if they had to fight in the light of day. It is true that the stronger lines would still have a good deal of strength left if they were to make all their rates perfectly open, and their weak competitors were to continue secret cutting and get all the traffic that was fought for. Nevertheless, the strong lines have millions of dollars invested in facilities for doing this competitive business, and no one believes that any one of them will ever give up the fight for a share of it. The excess of facilities—even if it were much less than it is—will insure very low rates, whether tariffs be secret or not secret. It would be a great gain if Mr. Smith's cure for demoralization could be made effective, but no one knows how to apply it, and it would remove only one of the troubles of the traffic managers after all. The situation, in all places where competition is sharpest, demands not only open rates, but also a means of inducing starving roads to stop the madness which leads them to throw away profits when the shippers are ready and willing to give a reasonable supply to each and all of the competing roads.

John E. W. Keely, the so-called discoverer of an alleged method of using the forces of nature, died in Philadelphia last Friday, 61 years old. Some of the newspapers express doubt as to whether or not he left behind him any explanation of the secret of his "motor." Obviously, if he did not, Keely-Motor stock can never again be sold. They need not worry; he left no such explanation, and there is no such secret. There was some simple mechanical trickery by which his "motor" was moved; but concerning his great epoch-making principle all is as plain as day. Keely knew as Hooley knew, and as humbugs and swindlers, big and little, have known since the creation of man, the imperishable and invaluable truth formulated by George Appo, "there is a sucker born every minute." The grave speculations about Keely and the pilgrimages to his shows have been but one phase of the fact that if you can excite a man's cupidity there is no end to his credulity. Vulgar and ignorant bunco-steerers entice into their "joints" dukes and bishops and scholars and bankers, and plain citizens, vain of their "horse sense," by the crudest uses of this good old fact. Keely was a circus performer with a "gift of the gab" and an air of conviction, and the intuitions of a born bunco-steerer. In all the 23 or 24 years that he worked his slick game he has never, in explanation of his "motor," written or uttered an English sentence that we have seen. He has put into print a great many English words with which we are all familiar, and a few words of a jargon invented by himself; but in the combinations in which he used them these words had no meaning whatever. No living man can remember the sense or meaning of any sentence of Keely's concerning the physics of his discovery, for the sufficient reason that he never wrote a sentence that had any sense or meaning, or into which he intended to put sense or meaning. All of this has been apparent for 20 years or more; and yet there are still left in the world people who take Keely seriously.

The quickening of the time of the night express train from Pittsburgh to New York by the Pennsylvania has been followed by a reduction of $1.50 in the fare between these cities over the Baltimore & Ohio and its connections. The latter road has put on a fast night express from Pittsburgh to New York, and it was the announcement of this, two or three weeks in advance, that led to the sudden determination of the Pennsylvania to put on its new train, as announced last week. The Baltimore & Ohio line between the two cities is 529 miles long, about 98 miles greater than the shortest distance over the Pennsylvania, and the time is also considerably more. An officer of the Pennsylvania says that in view of this difference in time his company will not meet the reduction which its competitor has made in the fare. The Pennsylvania has quickened the time through from St. Louis to New York. A fast mail train has been put on, leaving the former city at 2:45 a. m. and running through to New York, 1,065 miles, in 27 hours and 45 minutes. This train will have sleeping and dining cars.

A tariff for shipments over the Siberian Railroad as far as Irkutsk has been published. Irkutsk is the great trade center of Siberia, and the western terminus of the Chinese caravans over the desert, which have for ages brought a large part of the tea consumed in Russia. The new tariff on tea from Irkutsk to Moscow is 2⅓ rubles per pood, with a separate charge of 3 kopeks per pood for crossing the Yenissei and of 2 kopeks for crossing the Oka—great rivers where the bridges are not yet completed. This is at the rate of $3.30 per 100 lbs. The rate on high-class freight in the other direction is about the same. The distance from Moscow to Irkutsk is about 3,400 miles.

English Electric Railroads.—I.

Since the publication of our recent articles respecting the construction of new electric street railroad systems in England, there have been various developments worthy of placing on record. The Bradford accident, which occurred Sept. 19, had a tendency to cause a setback in some of the electric railroad projects. On that day, a loaded car was descending a steep grade, the tracks at the bottom of which make a sharp turn. When about two-thirds of the distance from the top, the car suddenly leaped forward and could not be controlled by the motorman, who applied both the hand and electric brakes. At the bottom of the grade the car left the tracks, was smashed and many were injured, while two have since died. Mr. W. J. Waugh, C. E., at the instruction of the coroner, made an investigation, which led to the conclusion that the car was equipped with sufficient brake power to keep it under control if intelligently used. He advised the addition of a slipper brake to each car, and the supply of more sand on each platform.

Among the municipal authorities which have recently investigated the question of mechanical traction may be mentioned the Sunderland Corporation. A deputation visited Hamburg, Brussels and a number of English towns, and unanimously recommended the trolley system. The work will cost complete about £250,000. The following is the estimate which has been approved for the equipment of the lines with the overhead wire:

23 miles of single track, with 95 lb. girder rails	£109,150
Bonding rails	6,900
Line equipment, complete	17,250
Feeder cables laid complete	9,200
5 per cent. for contingencies	7,125
60 single deck motor cars, complete	42,000
30 single deck trailers	6,600
2 car sheds	20,000
	£218,225

This amounts to nearly $50,000 a mile complete. To this there has to be added a sum for additional plant and machinery that will require to be installed at the municipal electric lighting works for the purpose of supplying a minimum of 350,000 Board of Trade units per annum for the trams at 2½d. per unit net. (If 500,000 units per annum, 2¼d. per unit; if 700,000 units, 2d. per unit.)

For providing a similar service (five minutes) the costs of other systems were figured as follows: Underground electric conduit, £307,857; cable, £249,252+ £57,500 for power station and machinery. Accumulator system, £210,935.

The maintenance charges per car mile, however, work out thus: Trolley, 6.907d.; conduit, 8.295d.; accumulator, 10.599d.; cable, 7.367d.

The present receipts per car mile on the horse tramways are 12.2d., and it is estimated that the net profit on the overhead system, to the Corporation, would be £25,241 per year; on the conduit, £14,602; the accumulator, total loss, £3,058 per annum; cable system, profit, £21,715 per annum. It is not difficult to see from the above why the Corporation decided as they did. Bids will doubtless be called for very soon for the various plant, machinery and rolling stock.

The Newcastle-on-Tyne Corporation has for some time past been considering the question of cable versus electricity for the city lines, and a cable expert and an electrical expert were called in to advise, with the result that the matter was left in a confused state.

The Glasgow Electric Tramways.

The Corporation of Glasgow has the most profitable system of street tramways, worked by horses, to be found in the British municipalities. Its profit per annum comes to about £80,000. For six years the question of mechanical traction was considered, and after a long and wordy warfare it was decided to give the trolley a trial on what is known as the Springburn system. Although there were municipal electrical works supplying the city with light and power, it was arranged that this Springburn tramway system should have its own power station and plant quite distinct from the lighting undertaking, so as to make a fair experiment. The experimental line was opened on Oct. 13 last. The route equipped for electric working commences in the center of the commercial district of the city of Glasgow. It extends for a good distance along fine, broad, perfectly straight streets. The gage of track is 4 ft. 7¾ in., the rails being of the girder type, weighing 100 lbs. to the yard. They were made in 45 ft. lengths, and were drilled by the makers with a 1⅜ in. dia. hole for bonding. The roadway was excavated to a depth of 13 in. for a 6 in. bed of Portland cement, with bitumen and granite chip grouting. The roadway between rails and for a space of 18 in. on either side of outside rails is paved with granite setts. Double rail bonds of the Daniels type (0000 B. & S. wire, 2 ft. 4½ in. long) are used, and in addition cross bonds of the same size wire are placed at intervals of 135 ft.

Perhaps the most important feature of this system is the use of the American span wire suspension system, the trolley poles also carrying arc lamps for the public lighting of the route.

The power station is within ½ mile of the Springburn terminus. The plant in position there comprises Babcock & Wilcox water tube boilers, with Vicars' mechanical stokers and McIntosh & Seymour tandem compound engines of 300 normal h. p. each. The exhaust steam is led to a Worthington condenser with circulating water, cooled by a Worthington cooling tower. There is a convenient arrangement for exhausting to atmosphere when required. All pipes are in duplicate, and are carried in a base-

ment beneath the engine room. The power house is built of brick, 61 ft. x 36 ft. x 34 ft. high. The boiler room is 33 ft. long x 46 ft. 9 in., and contains two 250-h. p. boilers with a heating surface of 2,530 sq. ft. and a grate area of 51 sq. ft. They evaporate 7,500 lbs. of water. The fuel used is Scotch slack, and the coal consumption per horse-power is placed at 2½ lbs. Blake & Knowles pumps are used. The stated efficiency of the engines is 90 per cent. The engines are directly coupled to three Westinghouse generators of 200 k. w. each. The combined efficiency of engine and generator is 85 per cent.

There are at present 21 single deck cars and four double deck; 23 have double bogies and 2 have single. The wheel base is 4 ft. for bogies and 6 ft. for single trucks. The spring base for single cars is 14 ft. long. The length over platform of bogie cars is 33 ft. 6 in. Each car accommodates 50 passengers. Each have both hand and electric brakes, angle iron collision fenders, wire cradle life brakes and pedal sand boxes. The motor cars are equipped with two Westinghouse No. 39 motors, with Westinghouse controllers, main motor circuit switch, automatic circuit breaker, cut out and lightning arrester.

The engineer of the lines is Mr. William Clark, and the electrical engineer is Mr. A. E. Le Rossignol.

A short section of the Glasgow lines, also worked on the trolley method, is at present being equipped and will be opened, it is hoped, by the new year. An idea of the extent of the conversion to electricity which may take place if this section is worked to the town's satisfaction, may be gained from the fact that the Glasgow Corporation at present operates 73 miles of tramways—the greater portion by horses.

Electric Traction for London.

In a recent issue we briefly referred to the opposition of the London County Council to the adoption of the trolley system for even the suburbs of London. Now this body is beginning to change its policy, and developments which have taken place within the past few months augur well for the future of London tramways. The Council has been taking more real interest in mechanical traction of late, in view of the fact that it has purchased 70 or more miles of tramways, and these lines will all come under its control early in 1899. They are horse lines, and mechanical power must eventually be adopted.

The Council has given its approval to the London United Tramway Company's proposal to put down a short length of overhead wire system if it will also put down two specified lengths of conduit. In this way they are probably hoping to have some experience in the neighborhood of London with both systems without spending any of their own money.

(To Be Continued.)

From London to Brighton in an Hour.

By J. Pearson Pattinson.

It is somewhat singular that Brighton, the most important seaside resort in England and but little more than 50 miles from London, should never, until the present month, have been within an hour's railroad journey of the metropolis. The fastest train between the two points has hitherto been the 5 p. m. from London Bridge (the company's city station), which performed the journey every week day in 65 minutes. Various reasons have been adduced for the apparent want of enterprise on the part of the railroad company, and of these the most convincing are that the first 20 miles (out of a total of 50) are jointly held by a rival and not too friendly company (the South Eastern), which has sole control over the signaling arrangements for a considerable distance, and, further, that the heavy suburban traffic of the Brighton railway tends to hamper the running of fast express trains.

The announcement was made a week or so back that, commencing on Sunday, Oct. 2, a new limited Pullman-car train would leave the Victoria station (situated in the West End of London) at 11 o'clock and run to Brighton in one hour, with a corresponding up train leaving Brighton at 9 p. m. A large gathering of people interested in railroad matters assembled at Victoria and at Brighton to witness the departure and arrival, and the trip generally turned out most successfully, as the subjoined table clearly shows. The gradients en route are somewhat severe from Victoria to East Croydon, there being two short stretches at, respectively, 1 in 62½ and 1 in 89. South of East Croydon full particulars are given on the gradient profile annexed.

The train load consisted of five Pullman cars, weighing about 23 (English) tons each, and two vans (about 12 tons each), making nearly 140 tons in all. The locomotive, one of a recent type constructed at the Brighton works in 1897 by Mr. R. J. Billinton, was a four-coupled bogie, with cylinders 18 in. by 26 in. and driving wheels 9 ft. 9 in. in diameter. The heating surface is 1,342 sq. ft. and grate area 18¾ sq. ft. The total weight of the locomotive is 42 tons 6 cwts., of which 28 tons 3 cwts. is on the coupled wheels.

Appended will be found a statement of the running on the inaugural trip:

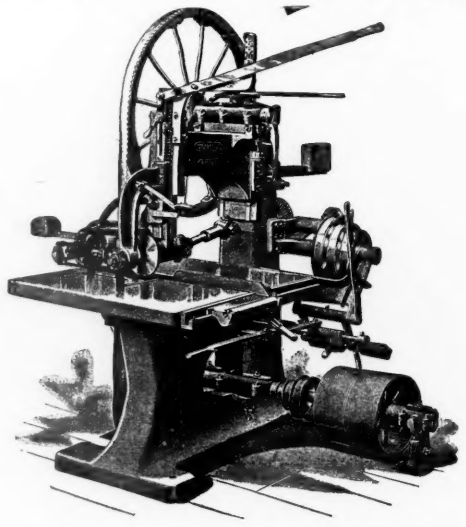
New Pullman Limited Express, London to Brighton in One Hour, October 2, 1898 (Inaugural Trip.)

Stations.	Distance. Miles. Chains.	Actual Time. H. M.S.
Victoria	——	11: 0:15
Grosvenor Road	0—64	11: 1:58
Battersea Park	1—24	11: 3: 9
Clapham Junction	2—58	11: 5:11
Wandsworth Common	4— 7	11: 7: 6
Balham	4—55	11: 7:58
Streatham Common	6—51	11:10:40
Norbury	7—35	11:11:37
Thornton Heath	8—57	11:13: 8
Selhurst	9—34	11:13:59
East Croydon	10—43	11:15:25
South Croydon	11—37	11:16:31
Purley	13—46	11:19: 6
Coulsdon	15—33	11:21:18
Merstham	19— 7	11:25:38
Red Hill	20—75	11:27:23
Earlswood	21—66	11:28:12
Horley	25—63	11:31:58
Gatwick	26—65	11:32:59
Three Bridges	29—40	11:35:58
Balcombe	34— 5	11:41:22
Haywards Heath	37—77	11:45: 8
Wivelsfield	40—47	11:47:51
Burgess Hill	41—53	11:48:43
Hassocks	43—62	11:50:57
Preston Park	49—41	11:57:12
Brighton	50—68	11:59:19

London, Oct. 20, 1898.

New Band Ripping Saw.

The illustration shows an improved band ripping saw, built by the Egan Company, of Cincinnati, O., which has some interesting mechanical features. The cored column is very heavy, and is free from vibration. The table, which is of ample size, has at the front a plainly stamped index. Idler rolls are fitted in the table to remove friction.

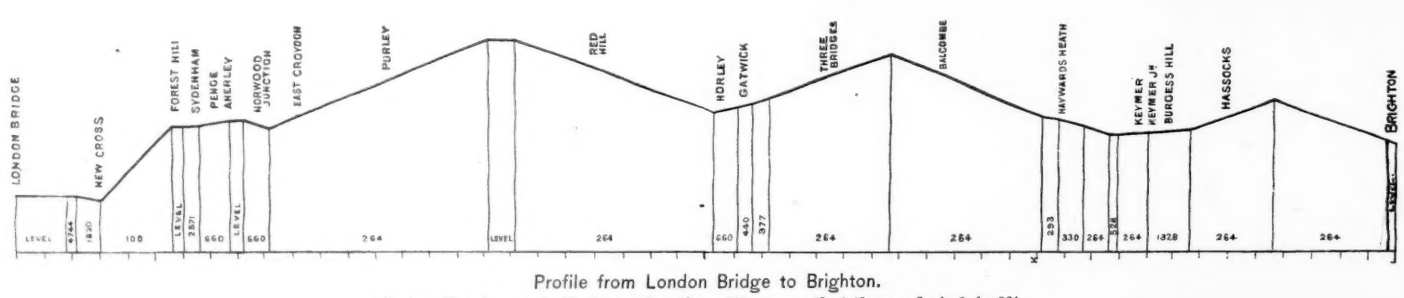


New Band Ripping Saw—Built by the Egan Co., Cincinnati, O.

The wheels on which the saw runs are 42 in. in diameter and made of iron and steel, the upper ones being designed especially light with spokes, while the lower one is heavy with a solid web. The upper wheel is fitted with an improved straining device, which controls the path of the saw blade on the face of the wheels. It is regulated by an adjustable weight and a compound lever, and is sufficiently sensitive to take up instantly any slack in the blade, adding much to the economical working of the machine and the life of the saws.

There are three speeds of feed, 60, 90 and 130 ft. a minute. Faster feeds will be furnished where desired. It will be observed from the illustration that the hand wheels and levers are in easy reach of the man controlling the machine.

This machine is the result of the work of designers who have given their attention to its construction for the past year, and its advantages, as summed up in a circular issued by the Egan Company, consist in its capacity for wide and thick material, its economy of power, rapidity of working, and the ease of adjustment of fences and rolls.



Profile from London Bridge to Brighton.

Note.—*The figures indicate grades, thus: 264 means that the grade is 1 in 264.*

TECHNICAL.

Manufacturing and Business.

W. C. Ennis, for 220 years Master Mechanic and Car Builder of the New York, Susquehanna & Western, has connected himself with the Chicago Pneumatic Tool Company, and will travel from the New York office of that company.

G. L. Buff has withdrawn from the co-partnership of the late firm of Buff & Berger. C. L. Berger has associated with himself his two sons, W. A. and L. H. Berger, and the business will be continued under the name of C. L. Berger & Sons, successors to Buff & Berger, who will continue the manufacture of mathematical and astronomical instruments of all kinds.

The Board of Commissioners, at the head of the Department of Docks and Ferries, of the City of New York, is asking bids until Dec. 2 for yellow pine timber amounting to about 1,643,872 ft. B. M. The form of agreement and specifications may be obtained from the office of the Board on Pier A, foot of Battery place, N. R., New York.

The Department of Correction, City of New York, is asking bids until Nov. 28 for furnishing 20,000 lbs. of white lead in oil. Form of contract and specifications may be obtained from the office of the Department, at 148 East Twentieth street, New York.

The Sterlingworth Railway Supply Co. has rented a plant in Montreal in which to make Sterlingworth brake beams for Canada.

Newspaper dispatches state that Pullman's Palace Car Co. has filed with the Secretary of State of Illinois papers certifying to an increase of capital stock from $36,000,000 to $54,000,000.

The Chihuahua & Pacific, with offices at 80 Broadway, New York, is figuring on pumping machinery for eight water stations.

New Stations and Shops.

The Wabash has filed plans in Buffalo for a new freight house, to be 400x25 ft.

The Chicago, Burlington & Quincy has taken out a permit to build a round house in Burlington.

The main building of the new Dayton Union station will be two stories high, 220 ft. long and 50 ft. wide, placed lengthwise of seven tracks. It is to be built of pressed brick, with tile roof, and will have a square tower on one corner. There will be a general waiting room, about 50 ft. by 90 ft., lunch room, dining room, and women's and men's retiring rooms, on the first floor. The second story will contain offices and a kitchen department. The general waiting room is in the center, and the ceiling is the height of two stories from the floor. This room will be fitted up with vaulted ceiling, supported on detached columns and penetrated with semi-circular transoms, admitting light above the roof of the train sheds. The floors will be of mosaic, and the finish woodwork will be hardwood throughout. South of this building will be a one-story building, also of brick, with tile roof, which will contain baggage and express rooms, as well as the power plant. The tracks will have covered platforms between them, 15 ft. wide between each pair of tracks, and 415 ft. long; the tracks will pass through a large double arched entrance way. Elzner & Anderson, of 18 E. Fourth street, Cincinnati, are the architects.

Another Injector Suit.

The Hancock Inspirator Co. of Boston, Mass., has brought suit in the Circuit Court of the United States for the Southern District of New York against the Hayden & Derby Mfg. Co. of New York City and Bridgeport, Conn., for infringement of patent No. 492,944, issued March 7, 1893, in and by the manufacture and sale of certain double-tube injectors.

Gasoline Engine for an Electric Lighting Plant.

A good deal of attention is now being given to small isolated electric lighting plants where generators are driven by gas or gasoline engines. The Norfolk & Portsmouth Belt Line, a part of the Pennsylvania System, has recently put in an installation at Port Norfolk, Va. This plant is used in connection with

the new loading and transferring docks, and since the plant has been completed the work of handling freight from cars and vessels can be carried on at night. Twenty-four arc lamps are used, while about 40 incandescent lights are distributed throughout the buildings. A 44-h. p. Fairbanks-Morse gasoline engine is used, fitted with an electric igniter and a self-starting device. The engine is belted to a countershaft from which the generator is driven. Provision has been made for the installation of a second dynamo when additional power shall be required. When it becomes necessary to use two generators, they will be arranged so that either one or both can be driven by the single engine. A similar lighting plant was lately installed at La Fox, Ill., on the Chicago & Northwestern, for lighting the sheep yards at that point during certain seasons of the year, so as to facilitate the loading of cars at night. At this place the Fairbanks-Morse engine is also used for pumping water for locomotive water station at that point.

Gold's Latest Electric Heater.

In our issue of Aug. 5 appeared a description of Gold's improved electric heater for street railroad cars. It will probably be remembered that in that heater the resistance coil is supported on a crimped or zigzag rod, the coil itself being wound on an open pitch. The heater is designed to give three degrees of heat, using three amp., six amp. or nine amp., as may be required. It has several other good points in detail, as, for instance, bringing out the connections through solid porcelain blocks, making them simple and durable. The Gold Company has quite lately produced a new front casing, designed to make the heater very ornamental.

THE SCRAP HEAP.

Notes.

The Southern Pacific is now converting a number of oil burning locomotives into coal burners.

The use of the public streets and squares of Cleveland as freight stations by the street railroads has been complained of more or less for a year or two back; and from an item in the Leader it appears that this annoyance to the public not only continues, but grows worse. The City Government is preparing to take action in the courts, or by means of new municipal legislation, to prohibit the suburban electric railroads from loading or unloading freight in the streets.

The Illinois Central in beginning its winter timetable has added a number of suburban trains between Chicago and Grand Crossing and Hyde Park; and from 8 to 8:30 a. m. and 5:30 to 6:10 p. m. trains will follow one another at intervals of five minutes. Chicago papers state that since the beginning of cold weather large numbers of regular travelers have left the street cars and returned to the warm and comfortable steam cars; in which, moreover, they are much more likely to find seats.

Hugh C. Griffin, 19 years old, was sentenced to imprisonment for life at Santa Rosa, Cal., last week for maliciously derailing a passenger train. It is said that Griffin belongs to an eminently respectable family; but he broke a switch and derailed a train in order to take revenge on a conductor who had detected him stealing a ride.

The Supreme Court of Missouri has decided that the law of 1894, providing for the sale of public franchises to the highest bidder, is unconstitutional. It is held that the act is vague and indefinite in its provisions. The suit was one to forfeit the charter of the West Side Electric Street Railway Company of Kansas City. It is said that the law was patterned after the similar law of New York state.

About $1,000 in money and jewelry was stolen from a sleeping car on the Pennsylvania train from New York to Washington arriving in the latter city at 4 a. m., Nov. 21.

The Circuit Court at Norwalk, O., has affirmed the verdict rendered in the Common Pleas Court against the New York, Chicago & St. Louis awarding $5,000 damages to Frank Schaffer, a brakeman, who claims that he was blacklisted by the company.

Daniel W. Getchell, the engineman who was adjudged responsible for the collision at Sharon, Mass., Aug. 21, has been held on a charge of manslaughter.

On the morning of Nov. 20 the principal shop in John H. Starin's shipyard at West New Brighton, New York harbor, was destroyed by fire. The building contained the machine, blacksmith, carpenter and boiler shops. The loss is estimated at $300.000

A westbound passenger train of the Santa Fe Pacific was attacked by robbers at 1 o'clock on the morning of Nov. 19, near Daggett, Cal., but the express messenger and his helper opened fire on them and repulsed them, and one of the robbers was killed.

The directors of the Pennsylvania Canal have asked the State Legislature for leave to abandon that portion of the canal between Newton Hamilton, Mifflin County, and Duncan's Island, Dauphin County. This part of the canal is already practically abandoned, some parts of it having been out of use since the floods of 1889.

The Maryland State Board of Public Works has decided to sell the state's interest in the Chesapeake & Ohio Canal. This canal extends from Cumberland, Md., to Georgetown, D. C., and was built almost entirely by the state. The reporters conjecture that the Reorganization Committee of the Baltimore & Ohio Railroad will buy the canal, so as to get rid of it as a competitor for the coal trade of Western Maryland.

A press dispatch from Ottawa, Ont., Nov. 21, says that the Canadian Government has seized 18 locomotives and 1,000 freight cars belonging to the Booth system of railroads for alleged non-entry when the engines and cars were brought into Canada from the United States. The "Booth system" means, presumably, the Canada Atlantic and controlled lines, of which C. J. Booth is President.

"The Royal Blue Limited."

The new train of the Baltimore & Ohio for the 3 p. m. five-hour run between New York and Washington has been exhibited in all the large cities on the line between Chicago and New York. In this four-car train each car is 70 ft. long.

The parlor cars are finished in vermilion wood, with an inlay of Persian design. "Royal blue" is the color of the ceiling, and the upholstery is the same, except in the ladies' room, which is decorated in dark olive green. The general design of the interior of the main parlor is Persian. An attractive effect is given both to the interior and the exterior of the cars by oval windows with opalescent glass. These are placed in the passageways and closets, where no one ever wishes to look out. The observation, café and smoking cars will seat 33 persons each. The parlor compartment is finished in vermilion, richly inlaid, the ceiling in blue and aluminum, and the chairs upholstered in royal blue.. The smoking compartment is finished in Circassian walnut, beautifully inlaid; the ceiling is red and gold, and the chairs are upholstered in olive-green leather. This car is provided with writing desk and materials for letter writing. The dining cars are named the Waldorf and the Astoria, and the service is under the direct control of the passenger department of the Baltimore & Ohio. There are now nine express trains daily in each direction between New York and Washington over this line, and three of them are five-hour trains.

Telegraphing Without Wires.

Monsieur E. Ducretet has lately described before the French Physical Society an apparatus invented by himself for telegraphing without wires, having the following general characteristics:

The transmitter is operated by a powerful Ruhmkorff coil, which produces a series of oscillatory electric discharges between two poles or spheres placed near together, and which are connected to two terminals, which serve to furnish electric capacity for the purpose of governing the oscillations in the current. The coil is inclosed in a box filled with very refractory insulating material, such as oil, etc. There is also necessary a source of electricity, which may be a primary battery, a secondary battery or a dynamo. A periodical interrupter, or circuit breaker, proportioned to the induction coil, the contact of which has a reciprocating motion, makes and breaks the circuit in mercury. If the apparatus is to be used on board ship the mercury interrupter is replaced by a toothed wheel. A hand key in the primary circuit of the induction coil is used like an ordinary Morse key to control the electric impulses which it is desired to send through the line. The receiver contains a tube called a radio-conductor, which is acted upon by the electrical waves set up by the oscillator at the transmitting end. This tube, which is acted upon by the local vibrations from the transmitter, controls a solenoid relay connected to a Morse automatic register, which receives and records the messages without attention from an operator. The electric waves are propagated through the ether in the same way as light waves are transmitted, and therefore no wires are necessary, except that one of the poles of the radio-conductor is connected to a vertical wire running up a pole or mast at the receiving end. The other pole of the tube is connected to the earth by a gas or water pipe, or in any other suitable way. Electric waves due to disturbances in the atmosphere are also propagated, just the same as those from any other source, but their effect on this apparatus is easily distinguished from the regular signals of the Morse key (or any other system of signals which may be used). Their effects may also be partly eliminated, so that no confusion is likely to arise. This apparatus can also be used for the automatic registration of local disturbances in the atmosphere, being received and recorded on a continuous roll of paper, moved at a uniform rate by clockwork, propelled by a machine which requires winding but once a week. Of the possible applications of this apparatus one is on board vessels, and it is hoped to make it in this connection of particular use.

The Western Railroad of Havana.

The report of this road for the year ending June 30, published in Herapath's Journal, shows that in spite of the disturbances due to the insurrection in Cuba, and the war between the United States and Spain, the road continued its business with practically little interruption. Passengers and employees were killed by bombs, and some engines, cars and bridges were destroyed, but the property loss appears to have been very moderate. The gross earnings were £109,209, and working expenses £66,297, leaving a balance of £42,912. This met the interest on the mortgage bonds, £23,400, and £19,300 was set aside to meet the damages occasioned by the insurrection.

Aluminum and Copper.

Mr. A. E. Hunt, President of the Pittsburgh Reduction Co., recently prepared a statement in which was compared some of the advantages of aluminum with those of copper for electrical conductors. In the United States, copper costs about 14 cents a pound and aluminum 29 cents, giving a cost ratio of .482. The density ratio of copper to aluminum is 3.332. Taking the electrical conductivity of copper at 100, aluminum has a conductivity of 63. On this basis, the sectional area of the former of a given resistance in length requires to be about 1.6 times that of an equivalent copper conductor, but since the density ratio is 3.332, the aluminum conductor has a weight of only .48 that of copper for the same length of resistance. As far as cost alone goes, there is but little difference. The tensile strength for a given section of area is about the same for both, but the equivalent electrical conductor of aluminum is therefore about 1.6 times as strong as copper of equal electrical resistance. As aluminum has less weight and greater strength than the equivalent copper conductor the former can be put on long poles with proportionately longer spans. Aluminum is said to resist corrosion much better than copper. The company is now building a $100,000 rolling mill, two 14-in. mills and four 9-in. continuous mills, also an 84-in. breaking down mill.

Improvement in Wentworth Ave. Line, Chicago.

On Sunday morning, Nov. 20, the new viaduct at Sixteenth street, Chicago, built in connection with the track elevation at that point, and mentioned from time to time in this column, was opened to general traffic, and the Wentworth avenue trolley cars began running over it to reach the business district by the Clark street line. On this line a motor car and trailer will be run regularly. The motor car is a remodeled grip car entirely inclosed at the front end, entrance being at the rear end from the trailer, the motor car having no side doors or steps. One conductor will collect fares from both cars. The motor cars are supplied with fenders, electric lights and electric heaters, and wooden trucks, designed by Mr. Charles E. Moore, Master Mechanic of the road, and built under his supervision. These trucks have been made the standard of the road.

Another Yellow Railroad.

The Wisconsin Central is to paint all passenger and freight stations and cars, and, in fact, all property susceptible to this treatment, a rich yellow. Whether or not the yellow adopted is the same shade as that so well known east of Chicago as the trademark of the Big Four and the Chesapeake & Ohio, is not stated. If it is the same, Mr. Ingalls ought to pay the Wisconsin Central something for the advertisement. Everybody looks upon yellow tank-houses and cattle pens as sure indications that one is on or near "an Ingalls road," and passengers coming from St. Paul to Chicago over the Wisconsin Central, bound for Washington or elsewhere in the East, will now be sure to continue their journey over the Big Four. After 400 miles of yellow the hypnotic effect will, no doubt, be proof against the wiles of all competing passenger agents at Chicago. The reporters call the Wisconsin Central the "Golden Rod Line." We lately saw a report from a committee of railroad officers in which they told their superior that the passenger painting of the C. & O. and the Big Four is the richest and handsomest in the country.

The Luxurious Train of the Siberian Railroad.

Reference has already been made in the Railroad Gazette to the luxurious vestibule train, eclipsing anything in the United States, which has been built for the Russian Government railroads and which is to run between St. Petersburg and Tomsk twice a month each way. For some time nearly every one of our European exchanges has published an account of this train, and it appears to be generally acknowledged that it has more conveniences than any other train in Europe. As for its superiority to the best trains in this country, the additional appliances for the comfort or entertainment of the passengers are either fanciful or else are supplied because the passengers are practically confined to the train during six days continuously, that being the time occupied in making a trip to Tomsk. Except for the stops at stations the train is in motion constantly for this time.

The library carried on this train contains everything published in recent times about Siberia, including 60 fine maps. The dining saloon contains a piano, and this room, when not used as an eating room, may be used by chess players. The cars have apparatus for cooling the air in summer which, it is said, "works rapidly yet produces neither draught nor chill." If this Utopian ideal is really accomplished in practice the designer of the apparatus will be wanted in America without delay. In connection with the gymnasium on the train there is a miniature apothecary shop. It appears that the steward on the train carries only cold food, and passengers desiring warm meals will have them ordered by telegraph from stations ahead; the food is then brought aboard the train. Tea and coffee are carried on the train. One of the trainmen speaks French and German.

General Electric Railway of Chicago Enjoined.

On Saturday night, Oct. 29, the General Electric Street Railway, Chicago, began laying track in Plymouth place and Custom House place, south of Polk street, but the work was stopped on Sunday by an injunction issued to the Chicago & Western Indiana. This was dissolved a few days later at a hearing, and an appeal was at once taken. No further work has been done, but the matter has since been in court. Judge Grosscup, in the United States Circuit Court, on Nov. 14, granted a temporary injunction to the Chicago, Indianapolis & Louisville restraining the General Electric from laying tracks in Custom House place between Taylor street and Fourteenth street, on the ground that its terminal freight facilities would be practically destroyed by the building of the electric road. At the same time it was held that the franchise of the General Electric was illegal, as the consent of the required number of property owners had not been secured. The General Electric secured a franchise in 1893, with the right to use a large number of streets on the South Side, under which no work was done until in October, at the points above named. Custom House place is a narrow street, which is always filled with heavy wagons, loading and unloading freight at the Chicago, Indianapolis & Louisville freight house; the street also furnishes the only means for reaching this freight house. The injunction issued will hold until the case is reviewed by the Court of Appeals.

A Purdue Lecture.

Mr. Samuel M. Vauclain, Superintendent of the Baldwin Locomotive Works and designer of the Vauclain compound locomotive, addressed the students of Purdue University, Lafayette, Ind., on Saturday, Nov. 12. His subject was the "Compound Locomotive." Among other things Mr. Vauclain showed how closely the service tests which he had made on Vauclain compound locomotives agreed with tests made at Purdue.

Sale of the Metropolitan Elevated, Chicago.

On Nov. 14 Judge Showalter, in the United States Circuit Court, Chicago, entered a decree of foreclosure in the case of the Metropolitan West Side Elevated, and ordered the road sold at a minimum

price of $6,000,000. The date of the sale has not as yet been fixed, but it will probably be held during the latter part of December, or the first part of January. The road has been in the hands of a receiver since January, 1897. It was incorporated in March, 1892, with a capital stock of $15,000,000, and with $15,000,000 of 5 per cent. bonds. The plan of reorganization, given out last July, provides for scaling the old bonds 40 per cent., and for a new issue of $9,000,000 preferred stock. The new bonds will bear 4 per cent. interest. At the time the receiver was appointed the traffic amounted to between 50,000 and 55,000 passengers per day; since the opening of the Union Loop the traffic has steadily increased, until the average daily traffic is now about 70,000 passengers.

Twelve Trackmen Killed.

On the Pennsylvania Railroad, about two miles west of Jersey City, N. J., on the morning of Nov. 18, a gang of track repairers, composed mostly of Poles and Italians, was run into by a passenger train and 12 of the men were killed outright or died within a few minutes. Two others were injured. It appears that the men stepped off the westbound track to get out of the way of a freight train and were struck by an eastbound passenger train. One man was on guard several rods to the west, but this man was killed with the others, and it would appear that he failed to hear the approaching train. The line is straight. There was considerable smoke from the westbound train, which obscured the passenger train, and it is said also that there was some fog at the time. The foreman barely escaped being killed.

The Gravity Railroad.

The abandonment of the gravity railroad of the Delaware & Hudson Canal Company between Olyphant and Honesdale, Pa., which is soon to take place, was the subject of a notice in the Railroad Gazette last week. In giving up the use of this property the company will have to write off from its books a large amount of capital, said by some to be over $9,000,000. This estimate appears to be based on the present valuation placed by the company on the whole of the gravity railroad and the whole of the canal, but it appears to be subject to some modification. In the last annual report the canal was valued at $5,500,000. Whether or not this is a total loss cannot yet be stated, as it is possible that the company may continue to use the canal for a part of its length, as indicated in our article last week. The item in the company's report, "boats, barges and steamboats," $580,000, includes boats and barges in New York harbor and on the Hudson River, as well as some barges used in the New England trade, so that this item is by no means to be wiped out. The gravity railroad, including equipment, stands on the company's books at a valuation of $3,500,000.

Pneumatic Mail Tubes.

A pneumatic tube has now been in use for several months for conveying letters between the General Post Office at Philadelphia and the Broad Street Station of the Pennsylvania Railroad. Preparations are being made to convey letters between the Post Office and the Philadelphia & Reading station by pneumatic tube. The first tube laid for the use of the Post Office Department in this country, that between the Philadelphia General Post Office and the branch in the Bourse Building, half a mile long, has now been in constant use since March 1, 1893. According to a statement in the Philadelphia Public Ledger, apparently official, the Government pays the contracting company $17,600 a year for the use of this tube. For the tube to the Pennsylvania station the Government pays $16,966 yearly. The line in New York, between the General Post Office and Station H, near the Grand Central Station, 3.5 miles long, which was laid a few months ago, is now in constant use 16 hours a day for letters, carrying about 90 per cent. of all the letter mail between its termini. The price paid by the Government for the use of this tube is said to be $158,000 a year. There is also a tube from the General Post Office southward to the branch at the Produce Exchange, and one across the bridge over the East River to the post office in Brooklyn. Mail is now dispatched from the General Post Office for points on the New Haven and the New York Central roads about 50 minutes later than formerly, though no change has been made in the advertised time. There is a similar saving on incoming mails. The tube in Boston, from the post office to the North Union Station, is used 21 hours each day, and carries all the first class mail. In Boston 36 per cent. of the wagon trips to the North Union Station have been discontinued.

Street Railroad Franchises in Milwaukee.

Mayor Rose of Milwaukee announces that the Milwaukee Electric Railway & Light Co. is ready to accept an ordinance which provides that it shall pay into the city treasury a graduated bonus running from $50,000 the first year up to $100,000, if the city will bind itself to prevent any further legal troubles for the company, drop the 4-cent fare matter, and give the company an exclusive franchise until 1924. After the bonus reaches the $100,000 mark the company is to pay that sum anually thereafter. In addition, when the earnings of the company reach a point where they are over 6 per cent. on the capital stock, the city shall be entitled to one-third the surplus. This proposition, the Mayor says, has his approval, and he will sign the ordinance in case it passes the Council. The friends of the 4-cent fare denounce the proposition as monstrous.

Lake Notes.

The Northern Michigan Transportation Co. has ordered from the Chicago Shipbuilding Co. a steel passenger steamer, to have a guaranteed speed of 17 miles an hour and to cost about $250,000. The steamer will be 240 ft. long over all; 40 ft. beam, and will draw 12 ft. She will be launched in April, and go into service in June next between Chicago and Mackinac.

The Bessemer Steamship Co. has ordered a new steamer to be built by the Globe Iron Works, of Cleveland. This steamer will be 475 ft. long over all and 50 ft. beam, with Scotch boilers and quadruple expansion engines.

Chicago Notes.

The great damage to the breakwater at Chicago by recent storms is attributed by the Park Commissioners to the abstraction of sand by pumping, which has been done for years by the sand dealers of the city. The removal of the sand is said to have weakened the foundations of the wall and piling. The Commissioners have decided to extend Lincoln Park 1,200 ft. into Lake Michigan, between North avenue and Diversay street, and thus force the sand pumping boats to work out in the lake over 1,200 ft. beyond the present shore line.

At Chicago, on the morning of Nov. 17, two steamers stuck fast between the piles in the draw of the bridge just outside the Grand Central Station, and six tugs and two locomotives worked until afternoon to release the boats and clear the draw. Meantime, the Baltimore & Ohio, the Wisconsin Central and the Chicago Great Western trains could neither enter nor leave the station.

The Illinois Steel Co. has bought 72 acres of land just north of its South Chicago Works. Chicago papers state that the company will soon engage in the manufacture of structural steel.

LOCOMOTIVE BUILDING.

The Baldwin Locomotive Works are building two 10-wheel engines for the Ann Arbor.

The New York Central & Hudson River is figuring on buying from 30 to 50 new locomotives.

The Maine Central has placed an order with the Schenectady Locomotive Works for two 10-wheel engines.

The Choctaw, Oklahoma & Gulf is having two more engines built by the Baldwin Locomotive Works.

The Philadelphia & Reading has given an order to the Baldwin Locomotive Works for four consolidation engines.

We have advice from China that the Imperial Railways of North China has arranged by private tender to have eight mogul engines built in America.

The order for six engines placed with the Schenectady Locomotive Works, and referred to in our issue of Nov. 4, was given by the Chicago, St. Paul, Minneapolis & Omaha and not the Chicago & Northwestern.

The Chicago, Burlington & Quincy is asking prices on two passenger locomotives, probably of the Columbia type, for fast mail trains. These are to be ordered immediately, and it is expected that it is preliminary to a larger order to follow.

The Baldwin Locomotive Works are building one six-wheel switcher for the Tennessee Coal, Iron & Railroad Co.; one eight-wheel engine for the Manistee & Grand Rapids; one 10-wheel engine for the Union Colliery and one narrow gage compound engine for the South West Virginia Improvement Co.

The Oregon Short Line has placed the order for the eight 10-wheel engines, previously referred to, with the Cooke Locomotive & Machine Works. They will have 19x26-in. cylinders; wagon-top type boilers, 66 in. in diameter; working steam pressure, 200 lbs.; fireboxes, 108 in. long and 38¾ in. wide; driving wheels, 57 in. in diameter, with cast steel centers; rigid wheel base, 13 ft. 3 in.; total wheel base of engine, 23 ft. 9½ in. The engines will weigh in working order 149,000 lbs., with 121,500 lbs. on the drivers.

The five simple 10-wheel locomotives which the Baldwin Locomotive Works are building for the Omaha & St. Louis road for December delivery, will have cylinders 18 in. in diam. by 26 in. stroke; drivers, 56 in. in diam.; fireboxes, 102 in. long, and will weigh 124,000 lbs., of which 102,000 lbs. will be on the drivers. The boilers will be of the wagon top type, the working steam pressure 180 lbs.; tank capacity for water, 4,000 gals.; and coal capacity, 10 tons. Westinghouse air brakes; Christie brake shoes; Leeds reversible couplers on pilots and Shickle, Harrison & Howard couplers on tenders; Ohio injectors; Sullivan piston and valve rod packings; Nathan sight-feed lubricators; Mertshiemer sanding devices; Standard tires; hammered iron axles; oak trussed brake beams; cast-iron wheel centers; Baldwin springs and Wabash standard headlights, will be used.

CAR BUILDING.

The Chicago & West Michigan is in the market for 100 flat cars.

The Rio Grande Western is receiving bids on 450 box, stock and flat cars.

The Lorain Steel Co. has placed an order for 40 steel cars with the Schoen Pressed Steel Co.

The Cheseapeake Beach has placed an order with the St. Charles Car Co. for two passenger cars.

The Oregon Short Line has issued specifications for some new passenger cars. Probably 10 will be ordered.

It is reported that the Baltimore & Ohio has placed an order for 3,000 more cars with the Missouri Car & Foundry Co.

It is stated that the Seaboard Air Line is considering buying new equipment, but we have no official information.

Armour & Co. have let the contract for the 1,200 refrigerator cars, mentioned in our issue of last week, to the Wells & French Co.

The Lake Shore & Michigan Southern has ordered 500 and the Pittsburg & Lake Erie 500 steel cars from the Schoen Pressed Steel Co.

We are officially informed that the Louisville & Nashville is not in the market for new passenger equipment, as stated by a contemporary.

As we go to press we learn that the Gulf, Beaumont & Kansas City is likely to give an order immediately from St. Louis for 300 box cars.

The Southern Pacific has ordered 16 cars for passenger service, eight from Pullman's Palace Car Co. and eight from the Barney & Smith Car Co.

The New York Central & Hudson River is about to award a contract for 5,000 freight cars, and it is likely that the other Vanderbilt lines will buy from 5,000 to 15,000 more.

It has been reported that the Northern Pacific will soon order new passenger cars, but we are officially informed that nothing definite has been decided about either freight or passenger cars as yet.

The Burlington, Cedar Rapids & Northern has ordered six first class passenger coaches, three from Pullman's Palace Car Co. and three from the Barney & Smith Car Co. These cars were mentioned in our issue of Oct. 14.

The Wisconsin Central car order mentioned in this column last week was let on Nov. 16, as follows: To the Michigan-Peninsular Car Co., 1,000 box cars; to the Ohio Falls Car Mfg. Co., 100 furniture cars, and to Pullman's Palace Car Co., 250 flat cars.

The Kansas & Texas Coal Co. is now receiving 150 new coal cars from the Missouri Car & Foundry Co. They are of 60,000 lbs. capacity and equipped with Westinghouse air brakes, National hollow brake beams, Shickle, Harrison & Howard bolsters and American continuous draft rigging. It is not unlikely that this company will again be in the market for new equipment in the near future.

The Grand Trunk is building at its shops 200 flat cars of 60,000 lbs. capacity. They will measure 35 ft. long and 9 ft. wide, and be equipped with G. T. axles; iron bolsters; Wood double truss brake beams; Christie brake shoes, Westinghouse brakes, lead lined brasses, Detroit couplers, G. T. standard draft rigging; M. C. B. standard journal boxes, with Fletcher lids, diamond trucks and 33-in. cast-iron wheels.

The Pennsylvania has ordered 2,000 Class Xh box cars, as follows: Murray, Dougal & Co., 150; Allison Mfg. Co., 150; Lebanon Mfg. Co. 100; Pullman's Palace Car Co., 400; Missouri Car & Foundry Co., 400; Terre Haute Car & Mfg. Co., 400, and Michigan-Peninsular Car Co., 400. They will be of 80,000 lbs. capacity, 34 ft. 8¾ in. long outside of body, and equipped with Westinghouse brakes, Janney couplers, steel bolsters and P. R.R. standard trucks.

The Chicago, Rock Island & Pacific is building, at its Horton, Kan., shops, 25 double deck stock cars. These cars will be of 60,000 lbs. capacity, and will weigh about 32,000 lbs. They will be 36 ft. long, 8 ft. 9¾ in. wide and 7 ft. ¼ in. high, and will be equipped with Westinghouse air brakes, Schoen pressed steel bolsters, Bettendorf brake beams, Janney couplers, malleable iron journal boxes, hammered iron axles, chilled cast-iron wheels and Chicago, Rock Island & Pacific standard trucks, draft rigging and brasses.

The Pennsylvania Lines West of Pittsburgh are building, at the Fort Wayne shops, 108 gondola cars for delivery this month, and will build 150 box cars for delivery Jan. 1 next. The ore cars will be of 100,000 lbs. capacity, and measure 28 ft. long over body, 8 ft. 11 in. wide and 10 ft. high. The box cars will be of 60,000 lbs. capacity, weigh 32,000 lbs. and measure 34 ft. 8¾ in. long, and 8 ft. 11 in. high over body, and 12 ft. 4⅛ in. high. Both classes of cars will be equipped with Schoen pressed steel bolsters, National hollow brake beams, Christie brake shoes, Westinghouse brakes, Janney couplers, Graham draft rigging, Pennsylvania Co. standard journal box lids, helical springs, arch bar type trucks and Bass 33-in. wheels. The box cars will have Wagner doors with common hasp fastenings. See last issue.

The Lynchburg (Va.) & Rivermont street railroad will buy one 24-ft. open car and one 16-ft. closed car.

All the electric trolley cars of the Yerkes lines in Chicago are being equipped with vestibules, and the grip cars of the cable roads will also be fitted with a device which will protect the gripman in bad weather.

The Metropolitan Street Railroad Co. (New York City) has placed an order with the J. G. Brill Co. for the bodies for 100 open and 100 combination open and closed cars, for delivery early next spring. Last January the road ordered, for experimental purposes, 25 of the combination cars, and it was owing to the success with which these cars met that the additional order was given. The only change in the new combination cars will be the substitution of Pantasote curtains for shutter blinds.

BRIDGE BUILDING.

BROOKHAVEN, MISS.—Press reports state that the Board of Supervisors will receive bids until Jan. 3 for building a steel bridge across the Homochitts River, according to plans prepared by E. P. Alsbury & Son, Houston, Tex..

BUFFALO, N. Y.—The grade crossing commission has approved plans for a subway at South Division St. and for a bridge at Elk St. E. B. Guthrie, Engineer, 436 Elicott Sq.

BUTLER, PA.—Press reports state that the Grand Jury has recommended an appropriation for a county bridge in Butler, over the Connoquenessing Creek. F. E. McQuistion, County Surveyor.

CATHLAMET, WASH.—Press reports state that bids are asked until Jan. 1 for building a drawbridge. Link, C. Burton, Clerk, Wahkiakum County.

FRANK, PA.—It is stated that the Baltimore & Ohio will build a bridge across Second Ave. in connection with a spur being built to a manufactory.

HARRISBURG, PA.—The Mayor and Councils have been petitioned by a committee of citizens to abolish a grade crossing at Market street, on the Pennsylvania and the Philadelphia & Reading railroads. A bridge to carry the street over the tracks is suggested. John E. Bickel is chairman of the citizens' committee.

JACKSON, MICH.—The City Engineer, Mayor and Board of Public Works have indorsed plans for a foot bridge to be built by the Michigan Central from Van Dorn St. to Liberty St. The bridge will be of steel, 326 ft. long.

LEXINGTON, MO.—Press reports state that it is proposed to build a bridge across the Missouri River at Lexington, to accommodate wagons and electric cars.

MAMARONECK, N. Y.—The Trustees will hold a special election on Nov. 28, to vote an appropriation of $3,000, the city's share of the expense of a new bridge over the railroad tracks at Rye Neck.

SHARPSBURG, PA.—Press reports state that the Consolidated Traction Co., of Pittsburg, contemplates building a bridge over the Allegheny River at Sharpsburg.

SPRINGBROOK, PA.—J. R. Pembridge and T. J. Matthews, of Springbrook, were successful in an application to the Grand Jury for an appropriation for an iron bridge and abutments, to span Springbrook, near Green Run. E. A. Barth, Surveyor;

Charles F. Wagner, Clerk, Scranton, Lackawanna County.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Boston & Maine.—Quarterly, common, 1½ per cent., payable Jan. 2.

Catawissa.—Preferred stocks, 2½ per cent., payable Nov. 19.

Mexican Northern.—Quarterly, 1 per cent., payable Dec. 2.

Buffalo & Niagara Falls Electric.—Quarterly, 1 per cent., payable Dec. 15.

Citizens' Traction (Pittsburgh).—Three per cent., payable Nov. 16.

Newport & Fall River.—Three per cent., payable Jan. 1.

Third Avenue (N. Y.).—Quarterly, 1¾ per cent., payable Nov. 30.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the Society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month, at 8 p. m.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7:30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, Secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month, except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Tuesday of each month, excepting July and August, at 7:30 p. m.

Engineers' Club of Columbus. (O.)—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburg, Pa., on the third Tuesday in each month at 7:30 p. m.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7:30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Railroad Surgeons.

The New York State Association of Railway Surgeons held its eighth annual meeting in New York City Nov. 17. Dr. C. B. Herrick, of Troy, N. Y., was in the chair. Papers were read by George Marsden, of Middletown, Claim Agent of the New York, Ontario & Western; Dr. J. F. Valentine, Colonel S. G. McLondon, of Thomasville, Ga., President of the Abbeville Southern Railroad and the Southwestern of Alabama, and a Director and Attorney of the Plant system; L. L. Gilbert, of Pittsburg, and others. The following officers were elected: President, Dr. Theodore D. Mills, Middletown; Vice-Presidents, Dr. J. L. Eddy, Olean, and Dr. G. N. Hall, Binghamton; Secretary, Dr. C. B. Herrick, Troy; Treasurer, Dr. H. P. Jack, Canisteo.

Central Association of Railroad Officers.

At the meeting of the St. Louis Division of the Central Association of Railroad Officers in that city, Oct. 14, Mr. J. J. Baulch, General Freight Agent of the Wiggins Ferry Co., read a paper on "The Use of Freight Cars in Local Switching Service," discussing the arguments pro and con concerning the payment of car service by belt lines and other railroads, which move cars only short distances. There are many inequalities in this service, the relations between each local road and its connections being generally based on a patchwork of bargains, which have been made from time to time as the growth of business made action necessary. Mr. Baulch says that local roads like his own have to do a good deal of work without receiving any pay for it, in consequence of the loose way in which railroads send empty freight cars long distances from home to get traffic which never materializes. Roads are also very free with their cars for the use of large shippers on local lines, so that, if a per diem rate were to be adopted, a line like that of the Wiggins Ferry Company would have to pay for large numbers of empty cars standing on private sidings, sent there to wait for loads. In spite of all the disadvantages, however, the Wiggins Ferry Company would be willing to pay 12½ cents per car per day for all cars, if that were made the universal rule. Mr. Baulch is always in favor of a per diem charge for car service against consignees (demurrage) at all times and in all places.

American Society of Mechanical Engineers.

The 19th annual meeting of the American Society of Mechanical Engineers will take place Nov. 29 to Dec. 2, inclusive, at the society's house, 12 West 31st street, New York City. The opening session will be held Tuesday evening at 9 p. m., at which time Mr. Charles Wallace Hunt will deliver the annual address of the retiring President. The second session will be opened at 10 o'clock Wednesday morning, Nov. 30. After the general business session the following subjects will be discussed:

Note on Strength of Wheel Rims. By A. K. Mansfield.

The Bursting of Small Cast-Iron Fly Wheels. By C. H. Benjamin.

Cooling Tower and Condenser Installation. By J. H. Vail.

Query: Does it pay to pickle ordinary castings?

Query: Has any improvement in foundry practice been observed from the recent investigations into the physics of cast-iron?

Query: What is the strength of pipe fittings made by the casting process?

Wednesday afternoon is left open for excursions and inspection trips. Wednesday evening a reception and conversazione will be held for the members and their ladies at Sherry's. At the third session, Thursday morning, the following subjects will be considered:

Theory of the Moment of Inertia. By C. V. Kerr.

Improvements in Steam Boilers. By W. B. Le Van.

Generation and Utilization of Steam by the Lykens Valley Coal Company. By R. Van A. Norris.

Valve Gear of the Willans Engine. By John A. F. Svenson.

Methods of Testing Indicators. By D. S. Jacobus.

Variation of Belt Tensions with Power Transmitted. By W. S. Aldrich.

Query: What constitutes a seamless tube?

Query: On how small a tool does it pay to put an individual electric motor?

Thursday afternoon a visit will be made to the new plant of the John Stephenson Co., Limited, at Elizabethport, N. J. The plant represents the most advanced practice in electrically driven tools.

The closing session will be held Friday morning, opening at 10:30 o'clock. Professional papers as follows will be considered:

Calorific Power of Weathered Coals. By R. S. Hale.

Mechanical Plant of a Modern Commercial Building. By W. H. Bryan.

Specific Heat of Superheated Steam and Experiments on the Flow of Steam Through Pipes. By R. C. Carpenter.

Query: Have you any new notions on machine shop floors?

Query: Is it of real advantage to submerge the smokebox of an upright boiler, to prevent expansion of the tubes?

Cincinnati, O., is being considered as the probable place for the spring meeting of 1899.

New York Railroad Club.

The annual meeting of the New York Railroad Club was held Thursday evening, Nov. 17. The following officers were elected:

President, H. H. Vreeland.
First Vice-President, C. M. Mendenhall.
Second Vice-President, Samuel Higgins.
Third Vice-President, D. B. McCoy.
Treasurer, C. A. Smith.
Executive Committee, W. W. Snow, G. W. West, A. E. Mitchell.
Finance Committee, R. M. Dixon, D. M. Brady, C. S. Henry.

Aside from the election, the feature of the evening was a lecture by Mr. Forney on "Conduct and Character." It was witty, learned and in Mr. Forney's best vein of moralizing. Mr. Forney would have been a very successful preacher if he had not chosen to be an engineer and editor.

The Detroit Engineering Society.

A regular monthly meeting of the Detroit Engineering Society will be held at the Hotel Ste. Claire, Friday, Nov. 25, at 8 p. m. A paper, entitled "Experiences in the Engine Room of the U. S. S. Yosemite," will be read by T. H. Hinchman, Jr.

Western Society of Engineers.

Those who attended the meeting of the Western Society of Engineers, Chicago, Wednesday evening, Nov. 16, expecting to hear an animated discussion of the papers on track elevation, read at the previous meetings, were disappointed. Considerable rivalry exists among the engineers of the several roads that have elevated their tracks, but there was an evident reluctance to criticise each other's methods in the open meeting, and only a few points were brought out which had not already been given in the papers. Mr. L. H. Evans of the Chicago & Northwestern stated that that road had used dimension stone for the faces of abutments at subways principally because the railroad owned its own quarries, but that stone was preferred to concrete as making a better appearing wall. The Chicago, Milwaukee & St. Paul, which has used concrete for abutments and retaining walls throughout, gave as a reason for its use, that concrete was cheaper, easier to handle than stone, and quite as durable; it does not own quarries. There was also some discussion as to the relative merits of pile bents and timber trestles for falsework, the Chicago & Northwestern using the former and the Chicago, Milwaukee & St. Paul the latter method of temporarily carrying the tracks. Mr. Edward H. Lee, Principal Assistant Engineer of the joint track elevation at the 16th street crossing, described in greater detail than had previously been given the methods used for carrying on the work at 16th street.

The paper by Mr. Elmer L. Corthell, "The Manchester Ship Canal," which was to have been presented, was carried over until the next meeting, because the illustrations for the paper had not been received from Mr. Corthell, who is in England.

Western Railway Club.

A meeting of the Western Railway Club was held Tuesday afternoon, Nov. 15, at the Auditorium Hotel, Chicago.

Mr. F. M. Whyte, Mechanical Engineer of the Chicago & Northwestern, and Secretary of the Club, presented a paper entitled "The Framing of Cars." Mr. Whyte considered the possibilities of so framing cars that the loads on the side and intermediate sills might be transmitted to points nearer the center of the body bolster, so as to reduce the bending moment about the center of the bolster, and thus aid in overcoming the deflection of that bolster. Prof. W. K. Hatt, of Purdue University, stated that he had investigated the deflection of a number of body bolsters by means of a formula which he had devised, from which it was evident that designs of body bolsters had been made which were sufficiently stiff for all purposes. One of these was the bolster designed by Mr. E. M. Herr and illustrated in our issue of Sept. 30 last. The results given by this deflection formula have been carefully verified by laboratory experiments, and found to be correct, and this method of calculating the deflection of bolsters will shortly be published in the Railroad Gazette. Mr. A. M. Waitt was the only speaker who seemed to have serious doubts as to the strength of metal bolsters, and repeated his former statements as to the advisability of using some device to reduce the side bearing friction and at the same time carry a portion of the load at the side bearings.

The topical discussion of the methods for handling ashes removed from locomotive ash pans seemed to show that the use of long cinder pits was considered the best practice, where a depressed track could be provided for the cars into which the ashes were loaded by hand. Special machinery for handling ashes was not considered economical. The practice of raising sand by means of compressed air for delivery to locomotives received general approval as being the most economical method.

PERSONAL

—Mr. Franklin Gardner, organizer of the Carlisle Car Co., died in Carlisle, Pa., Nov. 18. He was 78 years of age.

—Mr. Frank H. Conant, Past Assistant Engineer, U. S. N., died at the Naval Academy at Annapolis on Wednesday, Nov. 16. He was graduated from the Naval Academy in 1884, and was instructor there under two details.

—Mr. Edwin A. Kimball, an inventor and mechanical engineer, died in Chicago Nov. 14, aged 64 years. He was born in Orange, N. H., and was formerly an instructor in the mechanical department of the University of Illinois and Superintendent of the shops there. Recently he has been connected with the Western Electric Co. of Chicago.

—Mr. William E. Hale, for years President of the Hale Elevator Co. of Chicago, died in that city Nov. 16. Mr. Hale was born in Bradford, Mass., in April, 1836, and had been in business in the West for over 30 years. He organized the Hale Elevator Co. soon after the Chicago fire and retired from active business about eight years ago. One of his sons, Prof. George E. Hale, is the Director of the Yerkes Observatory of the University of Chicago.

—Sir John Fowler, Bart., K. C. M. G., died early this week at the age of 81. Sir John Fowler has long been one of the most distinguished and widely known civil engineers in the world, having been not only an engineer, but a man of fine diplomatic and business qualities, and for 30 years, at least, he has had to do with great enterprises in various quarters of the world. Latterly, in association with Sir Benjamin Baker, he has acted as Engineer for the Forth bridge, the underground railroads of London, the Hudson River tunnel, the irrigation of Egypt, etc. At least 25 years ago Sir John Fowler was the chief consulting engineer of the Khedive in vast enterprises which Ismail Pasha had projected, and under his direction surveys and estimates were made for an extensive system of railroads in the Soudan and for improvements in the irrigation works of Egypt. He has done important work also for the Government of India, and for many other governments. Thirty-three years ago he was elected President of the Institution of Civil Engineers. He was made a Knight Commander of the Order of St. Michael and St. George in 1885, and was made a baronet in 1890, after the successful completion of the Forth bridge.

ELECTIONS AND APPOINTMENTS.

Arkansas & Choctaw.—F. W. Valliant, Chief Engineer at Texarkana, Tex., has resigned. The position will remain vacant for the present.

Atchison, Topeka & Santa Fe.—W. A. Bissell, Assistant Freight Traffic Manager at Chicago, Ill., has been appointed Assistant Traffic Manager and will take charge of the Pacific Coast business. His headquarters will be, after Dec. 1, at San Francisco, Cal.

Atlantic & Danville.—Col. H. S. Haines has been elected Vice-President, with office at New York.

Boyne City & Southeastern.—H. J. White has been appointed Master Mechanic and Superintendent of Transportation, with headquarters at Boyne City, Mich.

Buffalo, Rochester & Pittsburg. — At the annual meeting of the stockholders, held in New York on Nov. 21, J. B. Bourne, Oscar Grisch and John L. Riker were elected new directors, succeeding Walston H. Brown, James A. Roosevelt and W. A. Wilbur.

Burlington & Missouri River.—Frank Harris, heretofore Chief Clerk to A. Campbell, Superintendent at McCook, Neb., has been appointed Assistant Superintendent, with headquarters at Denver, succeeding E. F. Highland.

Canada Atlantic.—John E. Connor, who was recently appointed New England Traveling Passenger

Agent at Boston, Mass., will, in addition to the duties of that office, perform those of his old position of Traveling Car Agent. (Nov. 18, p. 837.)

Central Branch Union Pacific (Missouri Pacific.—The officers of this reorganized road, elected at Atchison, are as follows: C. G. Warner, President; H. B. Henson, Vice-President; A. H. Caler, Secretary and Treasurer; D. S. H. Smith, Assistant Secretary and Treasurer. The headquartes are at Atchison, Kan.

Chicago, Burlington & Northern.—John A. Parker has been appointed General Agent at Minneapolis, Minn., succeeding J. C. Howard, resigned. A. L. Eldemiller has been appointed Traveling Passenger Agent, with headquarters at St. Paul, Minn., succeeding T. F. Hastings, promoted. The office of Assistant Superintendent at Minneapolis, held by J. C. Howard, has been discontinued. T. F. Hastings, heretofore Traveling Passenger Agent at St. Paul, has been appointed Trainmaster, with headquarters at Minneapolis.

Chicago Great Western.—C. A. Upton has been appointed Chief Train Dispatcher at St. Paul, Minn., succeeding D. McNab.

Chicago, Rock Island & Pacific.—S. F. Boyd, heretofore Assistant General Passenger Agent at Chicago, has been transferred to Davenport, Ia., as General Agent. J. L. De Veboise, General Agent of the Passenger Department at Portland, Ore., has resigned. He is succeeded by A. E. Cooper.

Chicago, St. Paul, Minneapolis & Omaha.—F. C. Gifford has been appointed Traveling Freight Agent of the Northern Division, with headquarters at St. Paul, Minn., succeeding E. Q. Thomas.

Choctaw, Oklahoma & Gulf.—F. W. Valliant, heretofore Chief Engineer of the Arkansas & Choctaw at Texarkana, Tex., has been appointed Assistant Engineer of the C. O. & G., with headquarters at Fort Smith, Ark.

Cleveland, Lorain & Wheeling.—Geo. Malone has been appointed Car Service Agent in place of Geo. O. Gray, resigned, with headquarters at Cleveland, O.

Fort Worth & Rio Grande.—B. G. Plummer, Master Mechanic, has resigned. He is succeeded by T. J. Shellhorn, with office at Fort Worth, Tex.

Georgia & Alabama Terminal (G. & A.)—The directors of this recently organized company are: J. D. Stetson, W. W. Williamson, C. D. Baldwin, L. Williams, C. A. Shearson and S. P. Shotter. J. Randolph Anderson was elected President, and J. D. Stetson, Vice-President; W. W. Williamson, Secretary and Treasurer. The first three Directors named are also directors of the Georgia & Alabama R.R.

Grand Trunk.—F. L. Corwin, Trainmaster at Detroit, Mich., has resigned. He is succeeded by John Irwin, heretofore Trainmaster at Richmond, Que.

Great Northern.—Since the appointment of F. E. Ward as General Superintendent, the following changes have resulted: C. Shields, Vice-President and General Manager of the Spokane Falls & Northern, Nelson & Ft. Shephard and the Red Mountain Divisions of the Great Northern, has been appointed Assistant General Superintendent of the Western District, succeeding F. H. Britton, transferred. Mr. Shields' headquarters will remain at Spokane, Wash. The Western District, over which he has charge, will hereafter include the Montana Division. F. H. Britton has been appointed Division Superintendent of the Dakota Division, succeeding James Russell, resigned, with headquarters at Larimore, N. D. J. M. Davis, heretofore Division Superintendent at Breckinridge, Minn., has been appointed Division Superintendent of the Montana Division, succeeding L. B. Button, resigned. Mr. Davis' headquarters will hereafter be at Havre, Mont. W. T. Tyler, heretofore Assistant Division Superintendent at Melrose, Minn., has been appointed Superintendent of the Breckenridge Division, succeeding J. M. Davis, transferred. Mr. Tyler's headquarters will be at Breckenridge, Minn. L. B. Allen has been appointed Assistant Division Superintendent of the Ferguson Falls Division, succeeding Mr. Tyler, promoted. His headquarters will be at Melrose, Minn. E. E. Lillee has been appointed Assistant Division Superintendent of the Northern Division, succeeding W. D. Scott, resigned. Mr. Lillee's headquarters will be at Grand Forks, N. D. General Superintendent Ward has appointed Wm. N. Neff as Chief Clerk, to succeed F. J. McLean, who has gone with Russell Harding to St. Louis, Mo. S. G. Yerkes has been appointed Traveling Passenger Agent, with headquarters at Seattle, Wash., succeeding J. A. Miller, promoted.

The active duties of the position of General Superintendent of the Montana Central, held by F. E. Ward, have been assumed by H. E. Byram, Assistant General Superintendent, whose headquarters are at Great Falls, Mont.

Kansas City, Watkins & Gulf.—Thos. Saunders, General Manager, with headquarters at Lake Charles, La., for the past four years, has resigned, and the office of General Manager has been abolished. Henry B. Kane, receiver, with headquarters at the same point, will assume the duties heretofore performed by the General Manager.

Missouri, Kansas & Texas.—C. Haile, heretofore Freight Traffic Manager, has been appointed Traffic Manager, with headquarters at St. Louis, Mo. W. B. Groseclose, heretofore Assistant General Freight Agent of the Texas line, with headquarters at Houston, Tex., has been appointed Assistant General Freight Agent, with headquarters at St. Louis, Mo. J. L. West has been appointed Assistant General Freight Agent of the Texas line, with headquarters at Houston, Tex., succeeding Mr. Groseclose.

Oconee & Western.—At the annual meeting of the stockholders, held at Empire, Ga., Nov. 8, the following officers were chosen by the Board of Directors: A. F. Daly, President and General Manager, with headquarters at Dublin, Ga.; J. W. Hightover, Vice-President; H. V. Mahoney, General Freight and Passenger Agent; W. N. Parsons, Secretary; E. J. Henry, Treasurer, with headquarters at Hawkinsville, Ga.; L. L. Rawls, Auditor; C. A. Coffee, Master Mechanic and Car Builder, and T. T. Holloman, Roadmaster.

Philadelphia & Reading Coal & Iron Company.—At a special meeting of the Board of Directors, held in Philadelphia Nov. 16, W. G. Brown was appointed Secretary, succeeding Franklin Kaercher, deceased.

Pittsburgh & Lake Erie.—Carl J. C. Zinck has been appointed Assistant to E. F. Wendt, Assistant Engineer of Construction and Maintenance of Way. (Nov. 18, p. 838.)

Rome, Watertown & Ogdensburg.—D. H. Johnson has been appointed Traveling Agent for the eastern and northern portion of New England, with headquarters at 290 Washington St., Boston.

Rutland & Canadian (Rutland).—The Directors elected by the incorporators of this road are: Geo. R. Bottum and C. L. Pierce, of Rutland, Vt.; Frank Wells, of Burlington; W. W. Stickney, of Ludlow, and Waldo P. Clement, of New York.

St. Louis, Iron Mountain & Southern.—W. H. Harris, Master Mechanic at De Soto, Mo., has resigned.

Union Pacific.—The Blue Valley Division of the Omaha & Republican Valley branch has been restored to the Kansas Division, under the supervision of J. O. Brinkerhoff, Superintendent.

Union Pacific, Denver & Gulf.—J. S. Turner, heretofore Superintendent of Motive Power on the West Virginia Central in Pittsburgh, has been appointed Superintendent of Motive Power on the U. P., D. & G., with offices at Denver, Col. Mr. Turner succeeds M. F. Egan.

Washington County.—W. W. Colby, heretofore Auditor of the Maine Central, has been appointed Auditor of the W. C., with headquarters at Calais, Me.

Western New York & Pennsylvania.—J. D. McDonald has been appointed City Ticket Agent of the W. N. Y. & P. and the Grand Trunk at Buffalo.

RAILROAD CONSTRUCTION,
New Incorporations, Surveys, Etc.

ALLEGHENY VALLEY.—This company is improving about six acres of land recently purchased in Pittsburgh, lying between Eighteenth street and Twenty-first street, in the Tenth Ward. All the dwellings and manufactories which formerly were erected upon it have been removed.. On this will be built a freight yard having a capacity of about 230 cars; all tracks will be laid in pairs, with wide driveways, which will be paved with block stone. At present there are about 100 men engaged on this work. The grading, track laying curbing, laying of sewers and water lines are being done by the company's forces, and are almost completed. The contract for the paving has been let to Booth & Flynn, of Pittsburgh. No work now remains for which contracts will be let. With regard to buildings on this property, no decision has yet been arrived at as to their number or extent. (Official.)

ANN ARBOR.—About a mile of new main line cut-off, between Toledo and Alexis, O., has been completed. The object of the cut-off is to take passenger service outside of what is known as the Ottawa River yards. (Official.)

ARKANSAS CENTRAL.—Grading is reported completed from Fort Smith, Ark., to a point five miles east of Charleston. It is expected that trains will be running into Paris by Dec. 1.

BALTIMORE & OHIO.—See Pennsylvania.

BOYER VALLEY.—Surveys are reported in progress for this line from the Chicago & Northwestern, at or near Sac City, to run southwest about 25 miles to Denison, Ia. Marvin Hughitt, President of the Chicago & Northwestern at Chicago, is among the incorporators. (Oct. 21, p. 768.)

CENTRAL OF GEORGIA.—Preliminary surveys have been made for an extension west from Columbia, Ga., but nothing definite is decided as to building. (Official.)

CHESAPEAKE & OHIO.—The tracks across the canal at Lynchburg, Va., are being raised to eliminate a heavy grade.

CHICAGO, ROCK ISLAND & PACIFIC.—Surveys are reported in progress for an extension from Rose Hill, Ia., north 60 miles, via New Sharon, Lynnville and Newburg to Marshalltown.

CHOCTAW, OKLAHOMA & GULF.—Johnston Bros. & Faught of St. Elmo, Ill., who received a portion of the contract for the Choctaw & Memphis extension to Little Rock, will sub-let the contract for grading, by five mile sections, from Howe, Ind. Ter., east 100 miles. (Nov. 18, p. 838.)

CLEAR WATER SHORT LINE.—This company has been incorporated in Montana to build a road from the main line of the Northern Pacific at Ainsworth, Wash., up Snake and Clearwater rivers to the Bitter Root Range, and over Lolo Pass to the main line near Missoula. Among the incorporators are: William Wallace, Counsel for the Northern Pacific, and A. D. Edgar, General Agent for the N. P. at Helena, Mont. This incorporation is undoubtedly for the proposed Missoula cut-off.

DENVER & RIO GRANDE.—It is expected that track will be laid by Dec. 1 on the branch of 6.1 miles from Leadville, Col., to several coal mines.

ELLAVILLE, WEST LAKE & JENNINGSVILLE.—This road is reported completed from West Lake, Fla., to Belleville, 10 miles, and an extension of 13 miles is under way. E. E. West of West Lake is President.

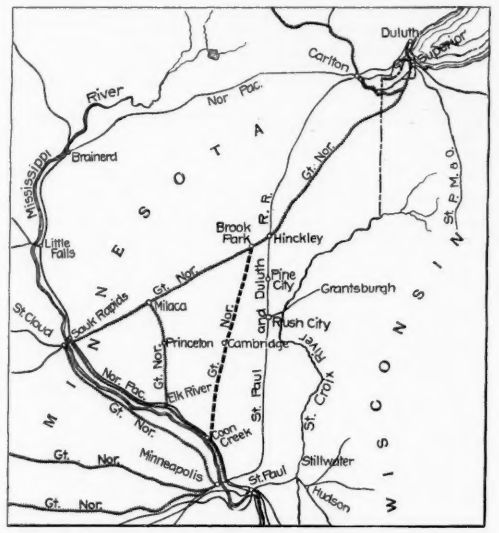
EL PASO & NORTHEASTERN.—Surveys are reported in progress for the extension from Alamogordo, N. M., southwest to El Paso, Tex. The Alamogordo & Sacramento Mountain branch is reported completed for 18 east from Alamogordo. (Sept. 2, p. 639.)

ESCANABA RIVER.—Rails are being laid, according to report, at the rate of half a mile a day, on this line from Escanaba, Mich., northwest toward Republic, about 60 miles. It is stated that 30 miles of road is to be completed this winter. Isaac Stephenson, of Marinette, Wis., is President. (June 3, p. 399.)

GILA VALLEY, GLOBE & NORTHERN.—Track is reported laid from Geronimo, Ariz., to Cutter, 49 miles, and it is stated that it will be completed to Globe, eight miles further, by Dec. 1. (Oct. 14, p. 750.)

GRAND RAPIDS, BELDING & SAGINAW.—This company has been incorporated in Michigan, with a capital stock of $350,000, to build 50 miles of railroad through the counties of Montcalm, Ionia, Kent and Barry. Congressman William Allen Smith, of Lansing, is among those interested.

GREAT NORTHERN.—Foley Bros., of St. Paul, are reported to have received the contract for the cut-off from Coon Creek, Minn., north about 50 miles, via



Coon Creek Cut-off of the Great Northern.

Cambridge, to Brook Park. When completed, this cut-off will shorten the distance between St. Paul and Duluth by about 30 miles. Surveys are completed. (Nov. 4, p. 804.)

ILLINOIS CENTRAL.—President Fish is quoted as saying that ground will be broken in the spring for the extension of his road from Ft. Dodge, Ia., southwest 110 miles to Omaha. The company has been incorporated as the Ft. Dodge & Omaha. (Sept. 23, p. 696.)

IOWA CENTRAL.—Surveys are reported completed for the proposed extension from Oskaloosa northwest 24 miles to Cordova, from which point it is proposed to run trains on the Wabash into Des Moines. The company expects to build the line next season. (Nov. 4, p. 804.)

KINDERHOOK & HUDSON.—Plans and specifications are completed, according to report, for the extension from Niverville, N. Y., to Rensselaer, and contracts are soon to be let.

KOOTENAY RAILWAY & NAVIGATION.—Foley Bros. & Guthrie of St. Paul, Minn., are reported to have taken the contract for the Nelson & Bedlington line of this company from Bonner's Ferry, Idaho, north 52 miles along the valley of the Kootenay River to Kootenay Lake, B. C. (Oct. 21, p. 768.)

LEHIGH VALLEY.—This company has recently completed an extension of its New Orange branch. This extension is a spur connecting the Lehigh Valley Terminal with the New York & New Orange Ry., operated by the New Orange Industrial Association. The line commences between Roselle and Aldeen, N. J., and curves to the right and north from the west-bound track of the L. V. T., and continues for a distance of 1,270 ft., through the lands of the L. V. T., to the N. Y. & N. O. track. John F. Dolan, of Elizabeth, N. J., was the contractor. (Official.)

MEXICAN ROADS.—Work is to be begun at once, according to report, on the line from the mining camp at Minas Nuevas, southwest through Parral, State of Chihuahua, to Lagunas de Juanoto, or some other point in the State of Durango, not less than 50 km. (31 miles). Samuel E. Gill of the Hidalgo Mining Co. of Pittsburgh, Pa., received the concession from the Mexican Government. (July 15, p. 522.)

MEXICAN SOUTHERN.—Grading will be begun soon, according to report, for the extension from Oaxaca, Mexico, south through the State of Oaxaca to Ejutla, 59 km. (36.7 miles).

A branch has just been completed through the State of Puebla, Mex., according to report, from Tlacotepec, west 30 km. (18.6 miles), to Las Pilas. It is proposed to extend the line through Tepeji to Acatlan.

MINNESOTA & IOWA VALLEY.—This company is incorporated in Minnesota, with a capital stock of $50,000, to build a line from the Chicago & Northwestern at Sanborn, southeast 70 miles, through Cottonwood, Watonwan and Martin counties to the Iowa boundary. The officers are: President, Marvin Hughitt, President of the Chicago & Northwestern, Chicago; Vice-President and Treasurer, M. M. Kirkman; Secretary, J. B. Redfield; Assistant Secretary, Edward S. Beaman. These are all officers of the Chicago & Northwestern.

NORTHERN PACIFIC.—The Executive Committee is reported to have authorized the building of 75 miles of road from Lewiston, Idaho, east toward Missoula, Mont., on the proposed Clearwater extension .

OREGON RAILWAY & NAVIGATION COMPANY.—Seims & Coykendahl are reported to have received a contract for building 140 miles of extension from Wallulu Junction, Wash., west to Lewiston, Idaho. It is understood to be a portion of the proposed line of the Clearwater Valley, recently incorporated in Oregon. (Nov. 11, p. 820.) Grading is being rapidly pushed both east and west from Riniaria.

PENNSYLVANIA.—A letter from the General Manager states that nothing is known at the company's office about a branch for which preliminary surveys are being made, from Upper Reese, Pa., about three miles. (Nov. 11, p. 820.)

PENNSYLVANIA CO.—The tracks for the accommodation of manufacturers in Columbus, O., have

proved insufficient to meet the demands for car room. It has been decided to lay tracks in the northeastern part of the city, crossing the head of Galloway Ave. Permission was given by the city council in July, 1891.

Senator McMillan, Chairman of the District of Columbia Committee, says he will urge the passage of a bill to abolish grade crossings in the city of Washington at the approaching session. The roads affected, should the bill pass, are the Pennsylvania and Baltimore & Ohio. Estimated cost to each $3,000,000.

PITTSBURG & LAKE ERIE.—The yards at Glassport, Pa., on which work was begun a year ago, are reported nearly completed. The tracks are reported to be nearly a mile long, and are nine tracks deep, giving space for about 1,500 cars. The yards will be almost entirely used for handling and storing coal. The double tracking from McKeesport, Pa., to the Glassport yards, a distance of over two miles, is under way.

This company has put in over 1,000 ft. of siding between Braddock and Rankin boroughs, Pa.

PORTLAND, VANCOUVER & YAKIMA.—The stockholders have decided to increase the capital stock to $250,000 for immediate extension of the road northeast toward Yakima. (Sept. 30, p. 716.)

RICHMOND, PETERSBURG & CAROLINA.—The third survey is reported under way for the extension of this line toward Richmond, Va. The first 20 miles from Petersburg south is completed. (Oct. 21, p. 769.)

ROSSFORD & TOLEDO.—This road, whose incorporation was noted in this column Oct. 21, is reported completed. It is a short connecting line from the Ford Glass Works at Toledo, O., to the Cincinnati, Hamilton & Dayton. Edward Ford, of Toledo, one of the incorporators, is said to control the road.

SEATTLE & INTERNATIONAL.—A spur about 2,000 ft. in length is being built from the company's line at Arlington, Wash., to the property of the Lincoln Shingle Co. (Official.)

SHREVEPORT & RED RIVER VALLEY.—Grading is in progress on 18 miles of extension from Coushatta, La., southeast. The company hopes to complete this about Dec. 1, and will soon let contracts for 11 miles more. (Nov. 11, p. 821.)

SONORA.—The General Manager of the Southern Pacific, which controls this line, writes that there is no truth in the report that the road is to be extended south from Guaymas, Mex., to Matzatlan, on the Pacific Coast. (Nov. 4, p. 804.)

SUMTER & WATEREE.—Bids are to be asked soon, according to report, for this line from Sumter, S. C., west 15½ miles, to Middleton's, on the South Carolina & Georgia. James D. Blanding, of Sumter, S. C., is President. (Oct. 28, p. 786.)

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—A bill has been introduced into the House of Delegates at St. Louis providing for two extensions of this line, one around the northern city limits, and the other to run to the Mississippi River south of the Chain of Rocks. This project has been under consideration for some months. (Jan. 28, p. 71.)

TEXARKANA & SHREVEPORT.—Rails are laid as far as Loma, eight miles south of the Arkansas line, and grading is in progress on the extension south five miles from Loma. (July 22, p. 539.)

TUSCARORA VALLEY.—A mortgage for $310,000 has been filed in Fulton County, to secure bonds to be issued for building this line from Port Royal, southwest 31 miles to McConnellsburg. (Oct. 7, p. 732.)

WATERVILLE & WISCASSET.—The stockholders have authorized the issue and sale of $160,000 of first mortgage coupon bonds for building this road from Weeks Mills, Mo., north 13.3 miles to Waterville. John H. Burleigh, of Waterville, is Chief Engineer. (Nov. 18, p. 839.)

WEST BRANCH VALLEY.—This company is being organized in Pennsylvnia, with a capital stock of $1,110,000, to build a connecting line from Clearfield, on the Buffalo, Rochester & Pittsburg, east 111 miles along the Susquehanna and its west branch, to Williamsport, on the Philadelphia & Reading. It is not improbable that this road is to form an eastern connection for the B., R. & P., whose line is now being extended to Butler and New Castle. Among the men interested are A. E. Patton, President of the First National Bank, Patton; H. B. Powell, Cashier of the County National Bank, Clearfield; A. R. Powell, President of the Clearfield National Bank; F. J. Dyer, Curwensville; S. F. Foresman, C. LaRue, Munson; N. B. Bugg, Williamsport, and R. R. Peale, of Peale, Peacock & Kerr, New York.

YORK SOUTHERN.—John Dobbling, of York, Pa., is reported to have received the contract for building the Dallastown branch from Red Lion, southwest about 1¾ miles to Dallastown. S. M. Manifold, of Dallastown, is Chief Engineer of the Dallastown Co. (Nov. 18, p. 838.)

Electric Railroad Construction.

ARTHABASKAVILLE, QUE.—J. E. Penault, of this place, asks incorporation of the Arthabaska Ry. Co., to build an electric railroad from Maddington Falls to Dudswell.

ASTORIA, ORE.—Local papers state that the Astoria St. Ry. Co. has given an option on its property to F. D. Kuettner, Auditor of the Astoria & Columbia River (steam railroad). A petition has been presented to the Council, together with an ordinance, giving Mr. Kuettner a 75-year franchise to build and operate street car lines and to erect poles for electric lighting and power purposes. It also grants him the right to lay a system of pipes to convey steam for heating or manufacturing purposes. Mr. Kuettner is believed to represent the Astoria & Columbia River Ry. Co. in these enterprises.

BALTIMORE, MD.—The Baltimore & Northern Electric Ry. has applied for a franchise to build two branch lines; one an extension of its tracks on Woodbury avenue, and the other to connect with the Baltimore City Passenger Ry. Co., on St. Paul street.

CHARLESTON, ILL.—The Charleston & Mattoon Electric R.R. Co. is reported incorporated, with a capital stock of $125,000, to build an electric railroad in Cole County. The incorporators are Forbes Holton, M. R. Williams and W. W. Patton.

CHICAGO, ILL.—The North Chicago St. Ry. Co. is completing plans for a street car line for the north shore district. The proposed route is in Dearborn Ave., two blocks north from Kedzie St., to Illinois St., east three blocks to Rush St., north in Rush two blocks to Ohio St., east in Ohio St. to St. Clair St., and north to Superior St., which is as far as St. Clair is opened at present. Condemnation proceedings are pending to open the thoroughfare to Chicago Ave., but property owners, objecting to the invasion of the street car, are opposing the extension of the street. If the ordinance is secured the plan is to run the Lake Shore cars in Dearborn St. to the Polk St. Station over the tracks now being used.

CORUNNA, MICH.—The City Council has granted a 30-year franchise to W. E. Avery, of Detroit, and F. J. Northway, of Durand, co-partners doing business under the firm name of the Long Lake, Durand & Corunna St. Ry. Co., giving them the privilege to build a street railroad through this city. W. E. Avery is associated with J. W. Winter and Dr. Lau, of Detroit, who now have an interest in an interurban line running out of Detroit. From this city the company will run over the Owosso & Corunna Traction Co.'s tracks, and it is stated that the two companies will be consolidated. (Durand, Aug. 19, p. 603.)

EAST LIVERPOOL, O.—J. L. Francis of Chicago is reported to be interested in the project to build an electric railroad between East Liverpool and Lisbon, connecting the Erie R.R. and the Ohio River.

EL PASO, TEX.—B. F. Hammett, Leigh Clark, J. J. Taylor and others are interested in a prospect to build a street railroad and lighting plant in El Paso.

FORT SMITH, ARK.—The Fort Smith Traction, Light & Power Co. will commence work on six miles of track by Jan. 1. The officers of the company are: Samuel M. Loud, President; J. E. Foster, Vice-President; A. N. Sicard, Secretary and Treasurer; J. L. Robertson, Engineer. An electric lighting plant will also be built. W. D. Boyce & Co., St. Louis, Mo., have the general contract for the work. (Nov. 11, p. 821.)

GADSDEN, ALA.—Local papers state that the motive power of the Gadsden & Attalla Union Ry. Co. will be changed from steam to electricity; the current to be supplied by the Alabama Light & Power Co., W. S. McCall, President, recently incorporated to build in Gadsden.

IRVINGTON, N. J.—The Common Council of Irvington has agreed on the terms of a franchise to run cars on Springfield avenue, which will be taken up by the North Jersey St. Ry. Co., of Jersey City. This line when built will be connected with the Irvington and New York line on the east and the Hilton and Maplewood line on the west. The North Jersey Co. will also extend its Clinton Ave. road from its present terminus to Elizabeth street, in Irvington.

LEXINGTON, IND.—Enoch H. Fudge, Benjamin Johnson and other capitalists of Chicago are considering the feasibility of building an electric railroad from Lexington, through Hanover and Madison, to Vevay, about 40 miles.

LEXINGTON, KY.—W. J. Loughridge, Vice President of the Belt Line Electric Co., and Dr. Bennett, President of the National Exchange Bank, are interested in a project to build an electric railroad between Lexington and Richmond, Ky., 22 miles. The road would cross the Kentucky River at Clay's Ferry.

LONDON, ONT.—U. A. Boucher, barrister, has submitted a proposal to the City Council, asking for a street railroad franchise.

LYKENS, PA.—The Lykens & Williams Valley St. Ry. Co. has completed its trolley road between Lykens and Williamstown. (Dec. 24, '97; Apr. 29, '98, pp. 919, 317.)

LYNCHBURG, VA.—W. H. Woodson, President of the Lynchburg & Rivermont St. Ry., writes that his company will build an extension from its present line to the city park, 1⅝ miles, overhead trolley construction; 90-lb. girder rails will be used on five blocks and on the balance of the route 48-lb. T rail. Two additional cars will be required, one open, 24 ft.; one closed, 16 ft. (Oct. 18, p. 839.)

MILWAUKEE, WIS.—The Milwaukee Electric Ry. & Light Co. is considering plans for building an extension to North Milwaukee.

NEW YORK, N. Y.—A certificate incorporating the Fort George Extension Ry. Co., of New York City, with a capital of $10,000, was filed with the Secretary of State Nov. 17. The company proposes to operate an electric road from 172d street to 185th street, in Eleventh avenue. Its Directors are M. G. Starrett, W. P. Plummer, John Lambden, Andrew Loughlin, D. W. Patterson, Harry Hartwell, John Kerr and Charles E. Corby, of New York City, and H. A. Himely, of Far Rockaway.

President A. J. Elias, of the Third Ave. R.R. Co., in his annual report said that during the year consents of abutting property owners to the change of motive power on all the lines of the company in the Borough of Manhattan and all lines of this company's system in the Borough of the Bronx, as well as the assents of the State Railroad Commissioners, have been secured, and the work on the main line is started. The change of the Forty-second St., Manhattanville & St. Nicholas Ave. Ry. Co.'s lines has also been begun. The $2,000,000 of additional capital stock long since authorized has been issued. Plans for the further issue of securities will be submitted to the stockholders as the improvements proceed. (May 1, p. 383; Sept. 9, p. 657.)

NILES, MICH.—The City Council of Niles has given a 30-year franchise to the Michigan & Indiana St. Ry. Co. This electric railroad is to run from South Bend to Benton Harbor, through Niles and Berrien Springs. (See South Bend, Aug. 19, p. 604.)

ROCHESTER, N. Y.—Press reports state that the Rochester & Lake Ontario Ry. Co. (the Bay Road), running between Rochester and Irondequoit, on Lake Ontario, six miles, will change its motive power from steam to electricity. This road runs three locomotives, nine passenger and a few freight cars. In 1893 it was leased in perpetuity to the Rochester & Irondequoit R.R. Co., which company was leased for 10 years from April 15, 1898, to the Rochester (electric) Ry. Co.

ST. LOUIS, MO.—M. B. Greensfelder, President of the St. Louis County St. Ry. Co., filed notice in the County Court of the intention of his company to immediately begin building a double track on St. Charles Rock road from the city limits to the Wabash Railroad, and on Lucas and Hunt road from St. Charles Rock road to the Natural Bridge road, and a single track on the St. Charles Rock road from the Wabash Railroad track westward two miles. The company also asks permission to erect poles and wires, as it intends to change the motive power of the line from horse power to electricity. The company has at present three miles of track and four horse cars.

SALISBURY, VT.—The Lake Dunmore Power & Traction Co. is reported organized to build an electric railroad through Salisbury, Leicester, Brandon, Pittsfield and Proctor to Rutland. Among those interested are W. T. Dewey and E. D. Blackwell, of Montpelier.

SAVONA, N. Y.—The Penn Yan & Pennsylvania Electric Ry. has 16 miles graded. No track has been laid and work has been stopped until spring. C. A. Cockroft, Engineer; J. D. Naves, Manager. (See Penn Yan, July 29, p. 556.)

SIOUX CITY, IA.—The City Council authorized the Sioux City Traction Co. to abandon its Crescent Park line, on condition that it will build a line in George street from West Seventh to West Eighteenth street.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending on the dates named.

Sept. 30.		1898.	1897.	Inc. or Dec.
Baltimore & Ohio.				
1 month	Gross	$2,536,271	$2,433,750	I. $102,521
1 "	Net	732,077	694,984	I. 37,093
3 months	Gross	7,343,729	7,051,072	I. 292,657
3 "	Net	1,834,740	1,966,923	D. 132,183
Burlington, Cedar Rapids & Northern.				
1 month	Gross	$533,598	$465,405	I. $68,193
1 "	Net	193,402	125,916	I. 67,486
9 months	Gross	3,220,867	3,015,945	I. 204,922
9 "	Net	1,011,603	891,417	I. 120,186
Central Pacific (Southern Pacific Co.).				
1 month	Gross	$1,485,754	$1,453,385	I. $32,369
1 "	Net	655,123	780,953	D. 125,830
Chicago & Eastern Illinois.				
1 month	Gross	$396,276	$346,571	I. $49,705
1 "	Net	186,908	155,722	I. 31,136
Delaware & Hudson Leased Lines.				
Albany & Susquehanna.				
3 months	Gross	$1,094,259	$1,155,260	D. $61,001
3 "	Net	514,466	572,270	D. 57,804
Rensselaer & Saratoga.				
3 months	Gross	$771,808	$782,336	D. $10,528
3 "	Net	332,651	356,661	D. 24,010
New York & Canada.				
3 months	Gross	$290,198	$299,171	D. $8,373
3 "	Net	134,302	120,576	I. 13,726
Grand Trunk.				
1 month	Gross	$1,866,730	$1,968,593	D. $101,863
1 "	Net	755,218	794,574	D. 39,356
3 months	Gross	4,991,199	5,339,068	D. 448,869
3 "	Net	1,805,732	1,914,517	D. 108,785
Lake Erie & Western.				
1 month	Gross	$332,816	$316,473	I. $16,343
1 "	Net	168,113	150,554	I. 17,559
9 months	Gross	2,565,496	2,549,700	I. 15,796
9 "	Net	1,049,642	1,046,605	I. 3,037
Lake Shore & Michigan Southern.				
3 months	Gross	$5,091,369	$5,218,684	D. $127,315
3 "	Net	1,818,940	2,033,287	D. 214,347
Minneapolis, St. Paul & Sault Ste. Marie.				
1 month	Gross	$502,371	$411,938	I. $90,433
1 "	Net	259,493	200,443	I. 59,050
3 months	Gross	1,136,584	1,056,504	I. 80,080
3 "	Net	496,574	465,148	I. 31,426
Missouri, Kansas & Texas.				
1 month	Gross	$1,258,378	$1,246,567	I. $11,811
1 "	Net	580,833	573,722	I. 7,111
3 months	Gross	2,917,834	3,042,254	D. 124,420
3 "	Net	992,725	1,092,621	D. 99,896
Pittsburgh & Western.				
1 month	Gross	$300,130	$287,740	I. $12,390
1 "	Net	93,723	75,460	I. 18,263
9 months	Gross	2,424,299	2,188,281	I. 236,018
9 "	Net	716,622	680,611	I. 36,011

Oct. 31.		1898.	1897.	Inc. or Dec.
Chicago Great Western.				
1 month	Gross	$543,529	$528,602	I. $14,927
1 "	Net	203,824	179,334	I. 24,490
4 months	Gross	2,012,741	1,923,947	I. 88,794
4 "	Net	734,304	658,976	I. 75,328
Cincinnati, New Orleans & Texas Pacific.				
1 month	Gross	$408,332	$319,392	I. $88,940
1 "	Net	139,818	105,114	I. 34,704
4 months	Gross	1,675,235	1,263,850	I. 411,385
4 "	Net	589,676	413,343	I. 176,333
Pittsburgh, Cincinnati, Chicago & St. Louis.				
1 month	Gross	$1,525,726	$1,429,082	I. $166,644
1 "	Net	654,975	417,444	I. 237,531
10 months	Gross	13,280,496	12,196,415	I. 1,084,081
10 "	Net	3,810,862	3,782,650	I. 28,212

BALTIMORE & OHIO.—An agreement has been reached with the committee representing the first preferred stock, by which all litigation will be withdrawn and the stock turned over to the reorganization committee for $75 per share, cash. The stock so bought is about 25,000 shares out of a total issue of 30,000 shares, and the remainder has been nearly all deposited under the plan. Ten thousand of these shares were owned by the Johns Hopkins University. It is announced that those who have deposited their shares may receive similar terms, if they prefer. This removes the opposition to the reorganization plan, and it is expected that the reorganization will be carried forward as rapidly as possible. On Nov. 16 Judge Morris, in the United States Court at Baltimore, granted an order on petition of the Mercantile Trust Co., New York, appointing A. S. Dunham and Arthur L. Spamer Special Masters, to ascertain the amount and nature of all indebtedness and claims against the company, and these claims, except mortgage liens, must be filed in writing with

the Special Master, under oath, by Feb. 1, 1899. (Oct. 14, p. 751.)

A special meeting of the stockholders of the Central Ohio has been called at Columbus, O., Nov. 29, to receive the report of the committee named to negotiate with the reorganization managers of the B. & O. (Nov. 11, p. 821.) The reorganization committee of the Staten Island Rapid Transit Company's first mortgage 6 per cent. bonds, due 1913, announces that a large proportion of the bonds has been deposited with the Guaranty Trust Co., New York, and that the time for receiving additional deposits is limited to Dec. 5.

Holders of stock and bonds of the Pittsburgh Junction are notified that the directors, at a meeting held Nov. 12 at Pittsburgh, appointed James J. O'Donnell of M. Holmes & Sons, John Z. Speer of Schoenberger Steel Co., and J. Painter, Jr., of J. Painter & Sons Company, of Pittsburgh, as an advisory committee to act in the matter of reorganization, under the proposition of the B. & O. reorganization plan. The directors deem that it is unadvisable to accept the proposed plan, or to deposit stocks and bonds with the proposed depositary, the Mercantile Trust Co. of New York. James J. Donnell, the chairman, requests holders of the various securities to communicate with the committee.

BUFFALO, ST. MARY'S & SOUTHWESTERN.—Henry Marquand & Co. and Edward Sweet & Co., New York, have been offering $1,000,000 first mortgage 5 per cent. coupon bonds, due 1927, at par, with interest. The bonds were largely oversubscribed.

CENTRAL PACIFIC.—The Shareholders' Protective Committee of Europe has begun action to restrain the Board of Directors of the C. P. from placing a blanket mortgage of $118,000,000 on the property to meet the indebtedness to the United States Government, and the mortgage debt of the road. (Sept. 26, p. 620.)

CENTRAL VERMONT.—The Reorganization Bill has passed the Vermont Legislature and received the signature of the Governor. The bill authorizes the reorganization of the corporation under the name of the Vermont Central Railway (instead of Railroad), with a capital stock of $3,000,000, and a bonded debt of $12,000,000, in 4 per cent. gold bonds. The bill must be accepted by the various interests within 60 days or it will become void. According to the statement of Charles M. Wilds, Master in Chancery, the total indebtedness of the company on Nov. 8 was $12,477,694. The new issue will therefore cause a sacrifice to the bondholders of $477,694, besides scaling down the interest from 5 per cent. to 4 per cent., making an annual loss of $70,000 on the $7,000,000 outstanding. Under the old agreement, the rental of the branch roads was $90,000 per annum; under the new agreement, the companies owning these roads will receive 4 per cent. annually on $1,000,000 of new bonds, making an annual loss to the companies of $50,000. Under the plan, it is stated, that the Grand Trunk will receive $271,775, of which $70,000 is interest on its traffic balances from March, 1896, to date, and $114,775 represented in a note given by the C. V. for former traffic balances. (Nov. 4, p. 805.)

CHICAGO & WEST MICHIGAN.—Coupon No. 34, due Dec. 1, of the 5 per cent. bonds, will be paid in full on and after that date at the National Webster Bank, Boston. (Oct. 28, p. 787.)

CINCINNATI SOUTHERN.—The Trustees have asked for sealed proposals until Dec. 20 for the privilege of extending all or any part of the outstanding bonds which fall due July 1, 1902, for a period of 38 years, at 3½% per annum. These bonds consist of two series, the first 7% bonds ($698,000 outstanding), and the second, 7.3% bonds ($8,209,000 outstanding.) If the funding can be effected the C. S. will save in interest nearly $350,000 per annum. The C. S. was built by the city of Cincinnati, which issued the bonds and owns the stock. It is leased to the Cincinnati, New Orleans & Texas Pacific, and forms a part of the Queen & Crescent Route. (Jan. 14, p. 35.)

DENVER, LEADVILLE & GUNNISON.—Marshall E. Johnson, Special Master in Chancery, sold this property in foreclosure, Nov. 18, to Henry Budgie, Charles A. Peabody, Jr., and Henry DeCoppet, representing the bondholders, for $1,500,000. (Oct. 28, p. 788.)

ELGIN, JOLIET & EASTERN.—J. P. Morgan & Co., of New York, and Drexel & Co., Philadelphia, offer for sale at 102½, with interest, $7,417,000 of new first mortgage 5 per cent. gold bonds, interest payable May and November. The total issue is limited to $10,000,000, but the remainder can be issued only for building and acquiring additional property. The entire capital stock is owned by the Federal Steel Co.

EVANSVILLE & TERRE HAUTE.—E. & C. Randolph, New York, offer $250,000 of first general mortgage 5 per cent. gold bonds, due 1942, at 98 flat. This is a part of the authorized issue of $7,000,000, of which $3,855,000 is reserved to retire prior bonds and the floating debt, and for improvements.

HUTCHINSON & SOUTHERN.—A petition has been filed in the United States Circuit Court at Wichita, Kan., by Mrs. Kate A Bennett, a stockholder, for the appointing of a receiver of this road. The company was in the hands of a receiver from Aug. 9, 1893, to Feb. 1, 1898, and has recently completed a number of miles of extension. (Aug. 19, p. 604.)

INDIANA & LAKE MICHIGAN.—The sale of this road, which was postponed from Nov. 10, is to take place at South Bend, Ind., Dec. 8. (Nov. 18, p. 840.)

LEBANON SPRINGS.—A controlling interest has been bought in this road for $20,000 by the same persons, it is thought, that recently bought the Rutland road. (June 10, p. 422.)

The L. S. runs from Chatham, N. Y., to Bennington, Vt., 57.1 miles, but operations have been entirely suspended for several months. It is thought that this line, with the recently bought Rutland, is to form a part of the new through line to Montreal.

LITCHFIELD, CARROLLTON & WESTERN.—In postponing the time of foreclosure sale until Nov. 26 the judge of the United States Circuit Court at Springfield, Ill., abolished the limit of $140,000, upset price. (Nov. 18, p. 840.)

NEW YORK, ONTARIO & WESTERN.—Holders of consolidated first mortgage 5 per cent. bonds, issued in 1889, are notified that the company intends to redeem the entire issue on June 1, 1899, at 105 per cent. Messrs. Kuhn, Loeb & Co., New York, offer the privilege of refunding these bonds into new 4 per cent. gold mortgage bonds, due 1992. Holders will receive a difference of 3½ per cent. in cash, interest to be adjusted as of June 1, 1899. (Sept. 23, p. 698.)

NORTHERN PACIFIC.—On and after Dec. 15, coupon bonds only will be accepted for conversion of old general first mortgage 6 per cent. bonds into new prior lien bonds, at the rate of $1,150 of the new bonds for each $1,000. (Oct. 7, p. 734.)

PENNSYLVANIA COMPANY.—Holders of first consolidated mortgage bonds of the Pittsburgh, Wheeling & Kentucky are notified that $4,318 is available for buying these bonds, and that proposals will be received until Dec. 15.

PHILADELPHIA & READING.—Alfred Sully, a bondholder, on Nov. 17, at Philadelphia, filed a petition in the United States Circuit Court, asking for a final accounting from the late receivers of the old company, and making charges that large expenditures were improperly made by them.

PITTSBURGH & WESTERN.—The United States Circuit Court at Pittsburgh, Pa., has given Thomas M. King, Receiver, permission to accept a loan of $500,000 from the Pittsburgh, Cleveland & Toledo, a leased line, of which the P. & W. owns one-fourth the stock. The proceeds are to be used for improving the road and for general expenses.

SAN FRANCISCO & NORTHERN PACIFIC.—Press reports from San Francisco state that A. W. Foster, President and a Director, and George A. Newhall, a director, have bought the 32,000 shares of stock owned by other parties, and, with the 28,000 shares already owned, are in absolute control of the road. This purchase involves, it is stated, no change in the Board of Directors, since these men have had control before; nor will it effect any change in the 20-year lease to the California Northwestern. (Sept. 30, p. 716.)

SEABOARD AIR LINE.—Thomas F. Ryan of New York has made application to the Court of Appeals of Virginia for a mandamus directing the officers of the company to permit him to examine the books and accounts. The committee of stockholders appointed after the last annual meeting to investigate the charges of mismanagement preferred by Mr. Ryan, invited him to appear before them and state his case, but he refused, and asked permission for an examination of the books and papers by Stephen Little in his behalf and at his expense. This request was refused, and Mr. Ryan appeals to the courts. (Oct. 21, p. 770.)

TERRE HAUTE & LOGANSPORT.—Master in Chancery W. P. Fishback, sold this property, subject to the first mortgage bonds, at receivers' sale at Crawfordsville, Ind., Nov. 18, to J. T. Brooks, for the Pennsylvania Company, at $1,060,000. (Oct. 28, p. 788.)

UNION PACIFIC, CENTRAL BRANCH.—The formal transfer of the main line, from Atchison, Kan., west 100 miles to Waterville, has been made to the Missouri Pacific. This does not affect the Atchison, Jewell County & Western, nor the Atchison, Colorado & Pacific, which will probably not be transferred before the first of the year. (Oct. 21, p. 770.)

UNION PACIFIC, DENVER & GULF.—At the foreclosure sale which took place at Old Line Junction, two miles from Pueblo, Col., at 2 p. m., Nov. 19, E. C. Henderson of New York, for the reorganization committee, bought the property for $9,250,000. This includes the Denver, Texas & Gulf and the Denver, Texas & Fort Worth. By the conditions of the sale, payment must be completed within 30 days. (Oct. 28, p. 788.)

WASHBURN, BAYFIELD & IRON RIVER.—The suit for the appointment of a receiver, instituted by the District Attorney of Bayfield County, Mo., has been discontinued. (Nov. 4, p. 806.)

WISCONSIN CENTRAL.—Under the new plan of reorganization, it is stated there is to be an issue of $20,000,000 of preferred and $20,000,000 of common stock, and that a new series of consolidated bonds is to be issued at 4 per cent., to retire all the outstanding obligations. The consolidated mortgage bonds now outstanding, it is stated, will receive 85 per cent. in the new bonds, and 37½ per cent. in new stock. The joint improvement bonds are to take about 65 per cent. of the new mortgage bonds, and the balance in preferred stock. The income bonds will be assessed 10 per cent. Preferred stock will be exchanged for the assessment and the bonds will receive dollar for dollar in preferred shares. There will be an assessment of $10 on each share of common and preferred stock. (Nov. 18, p. 840.)

WISCONSIN, MICHIGAN & NORTHERN.—This company was incorporated in Michigan Nov. 17 as successor to the Wisconsin & Michigan, with a capital stock of $130,000. It will include the extension of 16 miles from Faithhorn Junction, north to Quinnesee. (Oct. 7, p. 732.)

Electric Railroad News.

ATLANTA, GA.—A Baltimore syndicate formed by Middendorf, Oliver & Co., has bought out the Atlanta Ry. Co. The bonds of the company, amounting to $300,000, and the capital stock of $300,000, have been purchased. The company has 18 miles of track, and recently obtained a franchise to build 10 miles of additional track, reaching important suburban points. It is the purpose of the new owners to improve the property and complete the additional 10 miles by April 1, 1899. The company will be reorganized, with authority to issue $600,000 of bonds and $1,000,000 of stock. Of the bonds, $500,000 will be issued and the balance held in reserve.

DEPTFORD, TENN.—J. Bright, Manager of the Deptford & South Pittsburgh St. Ry. Co., writes that the company is out of business, and has gone into voluntary liquidation. The road was operated by horses, and is a little over two miles long.

HOOSICK FALLS, N. Y.—A bill consolidating the Hoosick Ry. and the Bennington Electric R.R. has passed both branches of the Vermont Legislature. This company operates the electric railroads in Hoosick Falls and Bennington, and has just completed a road about 16 miles long between the two towns. (See Electric Construction column, Apr. 1, p. 246.)

NEWTON, MASS.—The State Railroad Commissioners have authorized an increased issue of $83,000 to the capital stock of the Commonwealth Ave. St. Ry. Co., for funding floating debt incurred from construction and permanent additions to real and personal property. The capitalization of the road, with increased capital, is $258,000.

PHILADELPHIA, Pa.—The Southwestern Traction Co. has made a mortgage with the West End Trust & Safe Deposit Co., of Philadelphia, to secure a new issue of $450,000 of 5 per cent. first mortgage gold bonds, $50,000 of which are retained to guarantee the interest for 18 months.

RED BANK, N. J.—A committee of bondholders has been formed to effect a reorganization of the Atlantic Highlands, Red Bank & Long Branch Electric Ry. The Continental Trust Co. of New York City will receive deposits of bonds and issue certificates therefor until Nov. 30. The following comprise the committee: Silas B. Dutcher, Charles A. Porter, A. B. Eldridge, James G. White and John N. Partridge.

RUTHERFORD, N. J.—The Metropolitan Trust Co., of New York, as mortgage trustee, has brought suit, in the Court of Chancery at Newark, to foreclose the mortgage for $1,000,000 given by the Union Traction Co. Creditors have obtained judgments amounting to over $50,000, but the trust company claims that the mortgage is a prior lien on all the property.

SAN BERNARDINO, CAL.—The City St. Ry. Co. has gone out of business and is taking up its tracks. The road, which was operated by horses, was 3.13 miles long.

WASHINGTON, D. C.—The Belt Ry. was sold on Nov. 15 to Oscar T. Crosby, whose bid was $350,000. The sale was in accordance with a decree of the Supreme Court of the District of Columbia. The lines of the company consist of about 15 miles of track. The law requires the purchaser to equip the road with the conduit electric system within one year after the sale is ratified by the courts. It will become a part of the City & Suburban Ry.

TRAFFIC.

Traffic Notes.

The hearing of the complaint against the Baltimore & Ohio, made by E. T. Campbell before the Interstate Commerce Commission, alleging that freight was carried for less than published rates, has been postponed until Dec. 12.

There appears to be considerable disturbance among passenger men concerning east-bound passenger rates, in consequence of the action of some of the trunk lines in accepting differentials. It is said that the New York Central and its connections have authorized the Southern Pacific to make the same passenger rates over their lines from transcontinental territory to competitive points beyond Chicago as are used over the differential fare lines, i. e., $2 below the standard fare, between Chicago and New York. The Pennsylvania took the same action at the same time, or before all of the other trunk lines, except the Erie, and promptly served notice on all parties concerned that they would insist on their differential. That is, if the strong lines put their rate from Chicago to New York (for transcontinental business) down to $18, the differential roads will put their rates down to $16. The Erie, although a differential line, has not shown a disposition to take part in this general reduction of fares. It is reported that the reduction has been authorized at Omaha, as well as at points farther West.

The members of the late Board of Managers of the Joint Traffic Association, who were designated as a special committee to wind up the Association's affairs, have decided to limit the existenec of the Association to Jan. 1.

The Guarantee Ticket Brokers' Association, which has been holding its annual convention at St. Louis, announces that a fund of $10,000 will be raised to fight the proposed anti-scalping law in Congress.

Chicago Traffic Matters.

Chicago, Nov. 22, 1898.

Freight rates are now thoroughly demoralized in every direction. Hitherto most of the cutting has been on provisions, although all classe of freight are being gradually drawn into the melee. The first open cut is announced by the Chicago Great Western, which, on Dec. 16, will put in a local tariff of 15 cents per 100 lbs. on provisions, Missouri River to Chicago, a reduction of 8½ from the present tariff of 23½ cents. Provision rates from Chicago to the East are fluctuating between 12 and 15 cents, but there have not as yet been any open reductions, though a cut in the printed tariffs is now looked for. The two Pennsylvania lines are carrying 30 per cent. of the total freight eastbound. Passenger matters between Chicago and St. Paul and Minneapolis are shaky. The Soo line, practically with no excuse, has lowered its St. Paul-New York through rate to $23, to meet which a basis of $7 from the twin cities to Chicago is necessary. The St. Paul-Chicago lines promptly met the Soo's cut, and, therefore, are now losing $4.50 on each St. Paul-New York ticket, and the scalpers will probably use some of the tickets.

The presidents of the roads of the Central Freight and Passenger associations have approved the agreement of each organization as revised by the general freight and passenger agents. All reference to agreement, fines or penalties has been stricken out. A committee of general passenger agents of the lines members of the interchangeable mileage ticket agreement is now at work revising this agreement so that it will come within the law. This was a very strong agreement and many of its clauses were in direct conflict with the law as now expounded.

The differential fare question is worrying the general passenger agents of the standard lines considerably. There is likely to be a rate leveling with the differential lines, but the strong lines do not seem to be able to decide just how to begin. It appears that the Pennsylvania has already agreed to a proposal to put both the standard and differential lines on a common basis on through business (eastbound business from points west of Chicago and business to points west of Chicago from the East). This will be accomplished by cutting off the $3 difference in fares by which the standard lines now exceed the differential lines. On transcontinental business this condition is practically in effect now, and has been since the Interstate Commerce Commission ruled against the Canadian Pacific,